Pests

AND THEIR CONTROL

1941

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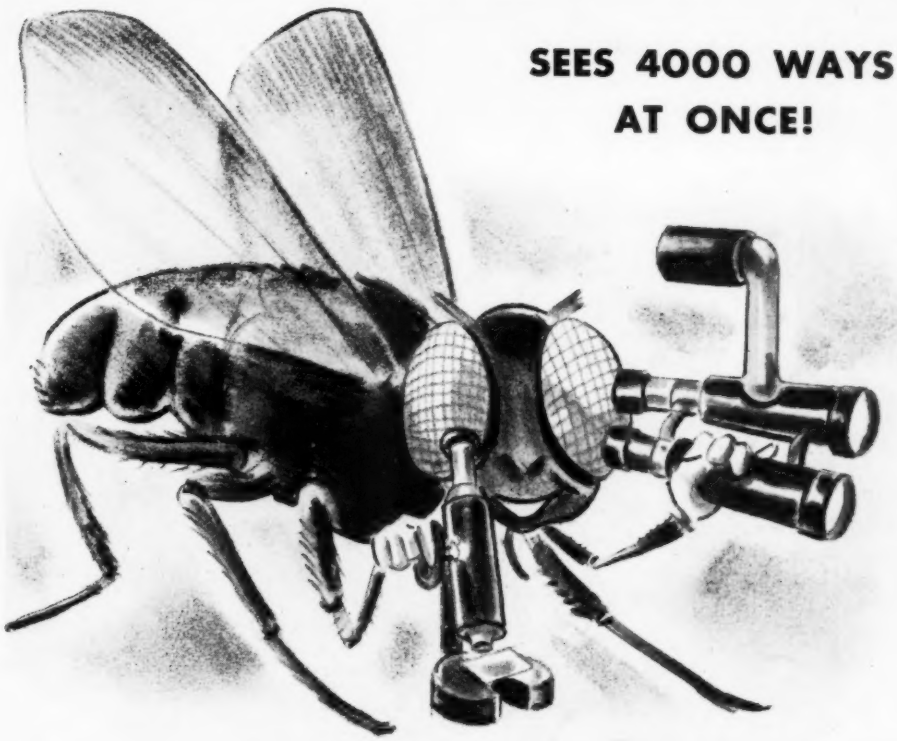

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Pests

and Their CONTROL

COOPERATING WITH NATIONAL PEST CONTROL ASSOCIATION

Exterminators, Fumigators, Termite Control Operators, Entomologists, Insecticide and Supply Manufacturers

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"Contributed articles in this publication do not necessarily reflect the opinions of the editors. The editors invite discussions, comments and all types of literary material pertaining to pest control and pests from any person interested in the advancement of the field."

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EDITORIAL

Price—Competition—Can It Be Controlled?

THE migraine of out-of-hand-price-competition, due generally to a basic insufficiency of business, which bedevils the Pest Control as well as most other industries, cannot be exercised by waving the magic wand of stricture. Rather, we believe, it can be controlled within tolerable limits through activation of dormant industry sales potentials converted into greater gross for all. One such "dormant"—flour mill fumigations—is analyzed in some detail by Mr. F. D. Hubbell in his article "FUMIGATION SERVICE" in this issue. Mr. Hubbell moreover gives some sage as well as timely advice on safe fumigation practices into which is incorporated the National Pest Control Association domestic fumigation procedures.

It is earnestly hoped you will find time to study his paper, which incidentally is the fourth of the "Public Relations" series to appear in Pests. If you do, you may find it answers some of the questions you've had in mind to ask.

Presenting the PCO

PICTURE the family doctor, home from the day's rounds. Each of his cases has drawn upon that fund of study and practical experience which we call "professional skill." Relaxing, he may indulge in the human satisfaction that his work has been useful. Then a magazine article catches his eye. It blandly announces that physicians and surgeons are now quite unnecessary, such nonsense having been outmoded by a patent medicine which cures all things. The product, conveniently, is on sale by the author.

Of the good doctor's reactions, the most charitable might be that the author, and possibly the reading public, could profit from further information about the medical profession.

Such is the position of the pest control operator (PCO) upon reading, in a recent issue of "Resort World," an article "Insects as a Hotel Problem." With no inclination to engage in controversy, a word concerning the pest control industry seems in order.

The story of that unique industry is drama, unwritten because unfinished. Its antecedents, just a few years back, were isolated craftsmen, good, bad and indifferent, getting along with pathetically inadequate tools. Today it is an industry actually on the threshold of professional status. The analogy of the medical profession is hardly far-fetched; unbiased judgment places the pest control industry at a stage corresponding with medicine only one generation ago, with dentistry only a decade ago. Progress of the past ten years has easily surpassed that of the previous hundred.

Unlike most trades and professions, facilities for technical education simply did not exist. Step by step, coordination was effected among the several established sciences allied with the specialized skill which is Pest Control. The present industry enjoys active cooperation of eminent entomologists, biologists, chemists and public health authorities. They are drawn from the government services, the universities and from commercial research laboratories. Some 500 pest control firms participate in a continuous and expanding program built around industry conventions and regional conferences held at cooperating universities.

Still other problems of the industry have received effective attention. Member firms of the National Pest Control Association have set up, and subscribed to, a rigid code of ethics. Research has included such subjects as cost accounting, insurance, materials and standards.

In the light of present day conditions, the answer to the hotel man's pest problem seems relatively simple: Engage a qualified PCO. He is available in most communities, and should be selected on essentially the same basis as a doctor—experience and reputation in his field. He may, indeed, be identified by the following characteristics:

(1) He is more concerned with performance than promises, hence does not feature "guarantees."

(2) He recognizes superlatives and extravagant claims as the stock in trade of the itinerant and the opportunist, and avoids their use.

(3) He does not represent materials or methods as "recommended by the U. S. Government," knowing that no official agency authorizes or sanctions such testimonials.

(4) He stresses economy of good service rather than "cheapness," for honest service cannot be rendered consistently below cost.

The informed PCO is familiar with technical developments in his field. If a chemical, or method, or type of equipment has outstanding merit, he is likely to employ it. And he is not obligated to ignore its limitations. He knows that there is no such thing as a cure-all.

In brief, the function of the PCO is to analyze requirements and to assume responsibility for correcting infested conditions and maintaining the property at a satsfactory sanitary standard. Evidence accumulates daily that good managers regard efficient pest control service as sound maintenance policy.

Rat-Baiting King of Sports in Old New York Days

DENIS TILDEN LYNCH in his recent book "THE WILD SEVENTIES" (Appleton-Century, $5.) in speaking of New York during the period between 1870-80 says there was corruption almost everywhere in the city, and not political corruption alone. Not only were the Sixth Ward slums unspeakably bad, but many sections farther uptown consisted largely of swamps, dumps, and shanty towns. Between Sixty-fifth Street and Sev-

entieth Street, west from what is now Central Park West to Columbia Avenue, for example, was a colony of rag-pickers' hovels. Eastward from Third Avenue to the river, between Ninety-second Street and 110th Street, was a large marsh gradually filling up with ashes, garbage and assorted refuse and junk.

Four-footed rats throve and multiplied, of course, under such conditions. They were then, with a kind of fine poetic justice, trapped and sold for the amusement of their contemporaries downtown. According to Mr. Lynch, practically every New York politician of any dignity in the Seventies regarded rat-baiting as the king of sports, and many a Tammany Hall heeler or Republican district boss owned dogs especially bred and trained to operate in rat-baiting events.

These events—at which ringside seats sold for $2.50 each—took place in zinc-lined or tin-lined pits about four feet deep and eight feet long. The rats were dumped in, a dozen or several dozen at a time, and allowed to warm up by running around for a while. Thereupon, the dog, usually a fox terrier, was introduced, and he went to work biting and snapping, the rats meanwhile squealing in terror and nipping at his tail and ears. Bets were placed on the time in which he could finish them off, which he generally did, in short order. A good dog, in fact, would finish off a hundred rats in thirty or forty minutes, and a champion could take care of as many in fifteen minutes, more or less. In 1895 an all-time champ killed 100 rats in 11½ minutes flat in Seeancas, N. Y.

Pest Control Research: English War Measure

THE EMERGENCE of a program of pest control research in England arising out of the needs of its war economy, as per quotation below which was made from Julian Huxley's* recent **New Republic** article "Scientist in Uniform: England"—should prove of welcome interest to PCOs concerned with the absolute values of their profession.

> **"But there are other fields in which science is hammering away at food problems. The need for accumulating reserves of food led to the establishment of huge stocks of grain and other storable products; these in turn attracted hordes of pests, such as grain-beetles and rats; and the damage caused by the pests has led to much research on methods of countering them. The most interesting work has been based on a careful study of their life history, habits and behavior, so as to detect the weak spot in their biological armor. The methods of that important branch of biology—ecology—are likely to be of permanent benefit."**

Final fruition of the important N.P.C.A. campaign for more adequate structural pest control research under Government aegis—which we have reason to believe may be a fact sooner than later—should serve as a worthy counterpart to the briefly outlined developments made known by Mr. Huxley.

**Noted English biologist and writer, the author of many books on scientific and general subjects.*

"Civility is the result of good nature and good sense."

Guard at Each Fumigation Urged

"Open season" for fumigation accidents arrives with the advent of the fumigation season now under way. Two of the almost impregnable lines of defense against the menace of fumigation accident case history types quoted below from the *"Discoid News Bulletin"* are: appropriate guard protection at each and every fumigation, plus "keep out" warning sign on "fumigee's" door. The warning sign usually omitted, paradoxically enough, at the request of the family, which request should firmly but politely be refused, thus making unnecessary the possible later substitution of another reading: "Omit Flowers."

"Despite the ordinary precautions taken by PCOs, people **do** sometimes enter places under fumigation. For example, some years ago a man who had been on a rather extended business trip returned home unexpectedly. He unlocked the front door and walked right into the house while it was under gas. In this instance, at the request of the family, the PCO had not put warning signs on the door, nor had they left a guard on duty.

In the case of ship fumigation, members of the ship's company have returned to the ship and have gone directly to their berths or bunks while the latter was still under gas or before it had been completely aerated. In some cases this has been due to incomplete or insufficient warning to the entire ship's company and in other instances it has been due to the fact that some members returning after having had a "good time" ashore have forgotten the warning. In the latter cases, perhaps a warning sign would not have been of any use as the individual might not have been in a fit condition to read or heed it. Similarly, locked doors are no barrier so long as anyone else may have keys to such doors.

In view of the fact that such things happen where PCOs take ordinary precautions, it is clearly up to the PCO to take *extraordinary* precautions to prevent such occurrences. The only practical preventative in such cases is to have an alert guard maintained on household fumigated jobs or to use a door knob lock. In the case of ship fumigation, an alert guard should be stationed at the gangplank or entrance to the ship, with strict orders to keep everyone off until the ship and all sleeping quarters have been entirely freed of gas."

Each market demands its own advertising job and a sufficient amount of money spent on advertising to do that job efficiently. We think it is a false economy to try to make the advertising directed at one market try to do the job for another market. Spread your advertising thin and you will get thin returns.—R. D. KEIM, Vice-President, E. R. Squibb & Sons.

PUBLIC RELATIONS

Fumigation Service

By F. D. HUBBELL, *Baltimore, Md.*

THE FUMIGATOR of many years standing knows only too well just how dangerous HCN and other powerful fumigants can be to himself and the public as well.

From intimate contact with many fumigators over an extended period, the writer knows that many of them have developed an attitude of complacence bordering on the careless, towards such fumigants. It wasn't so many years ago that the fumigator handling gasses had to work out in many cases application procedures of his own. More cases than one can be cited where the manufacturers supplied the fumigators with certain apparatus and application instructions that made the whole set-up as dangerous to handle as a nest of rattlers.

Methods, today, however, have been worked out which if followed should obviate most of the trouble for the experienced operator. So far as the public is concerned—especially in the case of home gassing—there is still much left to be desired in the way such fumigations are handled by the fumigator. Too short a ventilation period, and the practice of not moving occupants from adjoining buildings are two of the important safety measures most frequently mishandled. In spite of all the authoritative literature available on the subject, some fumigators—old-timers as well as new-comers—fall short of the desired methods to be employed.

Operators are still taking too many chances in letting occupants of fumigated areas return too soon. Fumigators are still letting people remain in the houses adjoining, in row-house fumigations, despite all evidence to the contrary, which proves, this practice to be highly dangerous. The order to fumigate should be refused unless these in adjoining houses are vacated until an hour or more after the fumigated house is opened, the adjoining houses should be opened for ventilation throughout the period of exposure as well. Contrary practice will, sooner or later, result in fatalities and living about such stringent regulations that business will be greviously injured thereby.

Mechanical Ventilating Aids

In the matter of giving proper ventilation, I have seen operators let occupants return after as little as two and one-half hours of airing. Of course this is an exception, but I am convinced that all of us will have to admit that we do not allow as long a time as we should. A house setting alone, and having plenty of windows, will have closets and even whole rooms that seem to empty of gas very slowly, at least on the side away from where the wind blows. Then, what happens in row houses and multiple-apartments where a good draft is not obtained in many sections even under what might be called ideal conditions, and, what happens in cold, damp weather, even though warning is given about not closing windows? Well, testing will show a very decided need for additional ventilation! How many fumigators make a practice of using mechanical ventilating aids?

After a short period in the presence of HCN gas, the professional fumigator knows his olefactory sense becomes an unreliable "barometer" to judge correctly the degree of gas concentration present. This important fact must without question be taken into consideration before the structure is made habitable again. A house aired for a few hours with a good breeze blowing through it may appear to be entirely free of gas. Yet, shut it up again—which is what the home owner does in cold weather—and a dangerous dosage of gas—which clings to all surfaces—reappears from hollow partitions, materials, etc. The dosage built up gradually and unnoted by the house occupant—who may as previously indicated, have closed the house because of the sudden weather change—becomes dangerous.

This point is especially appreciated by operators of metal gas chambers, where one would think all the gas would be cleared out very easily. But empty the chamber of fumigated material, air it out, then close it up for a few hours, and you find a deadly dose of gas present. Now, consider how much more of a dosage will develop in a house full of furnishings if it is closed too soon or improperly ventilated.

In many cases where a heavy charge of HCN Gas was applied in cool, damp, weather, I have found it necessary to open, air, close up and heat up, twice a day for as many as three days and nights before I considered it safe for people to inhabit. And, in all these cases two or more very large (27 inch ventilating fans were used for hours each day.

Most fumigators make the mistake of not having several large portable electric fans in their possession, ready to use one or more according to the amount of breeze, the size of the house, the dosage used, the amount of material in the space fumigated, and the amount of humidity present. On damp, hot or cold, days ventilation must be at least 100 per cent longer than on dry, airy days. Only close observation will tell you how long to ventilate. Even when a comparative light dosage and short exposure (as for bed-bugs) is used, it should be a hard and fast rule to not let occupants back to sleep on the premises the night of the day of fumigation. With heavy dosage and long exposure an airing of 24 hours, as a minimum, should be observed. But when a heavy dosage is used and the airing takes place during cool and damp weather, even a longer time must be employed to be safe. This point should be made plain to the customer at the time the order is taken, then if bad airing weather develops you will have no trouble keeping him out longer, and he will be more convinced of your ability, your care, and your responsibility.

Recently I had occasion to fumigate three woolen blankets in a gas chamber. After removing them, they were hung on a clothes line for an hour, then vigorously shaken, folded and placed in the basement for another hour. At the end of that period the blankets had liberated enough gas to almost drive me out of the cellar. With such an object lesson before one, the condition that may obtain inside a fumigated house may be more readily understood.

The best experience I know of is for a fumigator to gas his own house,

and then go back and try to live in it before at least 24 hours airing. A Pest Control Operator just starting in the fumigation field, would find this a valuable addition to his store of practical knowledge. It is safe to predict he will allow many more hours for airing on all future jobs.

Flour Mill Fumigations

It is a fact that many medium-sized flour mills (175,000 to 400,000 cu. ft.)—of which there are several hundred scattered throughout the country—spend more for ineffective sprays and low concentration fumigants than it would cost to have two regular fumigations a year. Mill structures in poor condition—reinfestation from second-hand bags—incoming wheat and feeds, create for the mill owners a constantly recurring pest control problem. These factors plus a new Federal Law have made the mill owner increasingly fumigation conscious. Substitution, therefore, by the mill owner of his own control measures for that of the professional fumigator, should normally result in a corresponding increase in pest control efficiency.

Seal and Clean-up

Bids on mill fumigations submitted by the fumigator should not include the service of sealing. It is best for the fumigator to advise the mill owner how and what to seal, which the latter can do at a saving in cost to himself. Hence, when you arrive on a job, it is essential to check on what has been done and make additional suggestions necessary. Before fumigation is undertaken it is best to specify: 1. broken window panes to be replaced; 2. additional carpenter work needed to make building tight; 3. dust collector ventilators on the roof to be sealed. Since some of these mills are none too tight, it is essential to warn the owner about sealing all windows. Sufficient dosage to be applied to do a satisfactory job must be a matter of your own professional judgment. Since the average flour mill owner will not shut down long enough ahead to properly clean up reels, conveyors, sifters, etc., it is advisable not to guarantee a 100% kill. It is, however, necessary to impress on him the better the "clean-up-and-seal" the better job he will receive. If, in spite of this, you discover on "Fumigation Day" the mill is still in poor condition as to "seal-and-clean-up," you should be frank and make it clear the results won't be what they should under the circumstances but that you hope for the best. The mill owners and their personnel are a group of men who are rarely unreasonable in their percentage-of-kill-requirements since in most instances they are not unaware of the difficulties involved. In the existing situation, however, an offset of a far above the average dosage is called for. Where the mill fumigation has been sold not only on a cubic footage basis but dosage basis as well—as it properly should be—the extra dosage presents no special problem.

In conclusion, the flour mill field is one that the professional fumigator should contact with greater regularity. It presents without question an opportunity for service which should prove mutually advantageous to flour mill owner and fumigator alike.

Domestic Fumigation Practices Recommended by N.P.C.A.

At the Eighth Annual NPCA Convention in Indianapolis on October 30, 1940, the Fumigation Committee under the Chairmanship of Mr. Bartlett W. Eldredge, submitted a report on good domestic fumigation practices, which was accepted by the Convention assembled. Since there can be no such thing as too much publicity where the vital question of safety is concerned, reprint (below) is made of such recommended measures from NPCA Membership Service Letter No. 186.

1. No crew be allowed to fumigate unless they are properly equipped with gas masks approved by the U. S. Bureau of Mines and which have been properly tested before entering into the gas.

2. All fumigating crews be required to carry to all jobs sufficient warning signs and such safety devices as necessary.

3. No fumigation of any building and re-occupancy take place within the same 24 hour period, and in no event shall a fumigated space be re-occupied before an 8 hour ventilation period. This does not include a treatment for mice or rats in burrows and harborages.

4. No partial fumigation of any building be allowed unless the entire structure be vacated.

5. On every job one or more watchmen be on guard outside the fumigated structure during the entire period from the time of the fumigation until it is safe for experienced fumigators to enter without masks.

6. All greasy or damp food stuffs be removed. This is also to include milk, butter, green vegetables, eggs, opened and not corked bottles of liquids, unexposed film, fine clocks, and all plants and pets.

7. All toilets are to be flushed at the completion of the fumigation. If toilets are used for the disposal of any fumigant residue, several flushings should be made.

8. Any premise to be fumigated will be sealed in such manner as to confine the fumigant to the space intended to be fumigated and careful examination will be made of all parts of the enclosed space to determine that no persons or domestic animals remain before fumigation material is distributed and the final exit made.

9. Lock all doors and accessible windows; place warning signs on all entrances before the fumigant is released.

10. Two or more experienced men be on every fumigation job, both at the time of releasing the fumigant and at the time of initial ventilation. Under no circumstance should anyone but an experienced fumigator be permitted to conduct or supervise a fumigation.

11. Fumigation regulations in effect in the city, municipality or state in which fumigation operations are to be performed will be strictly complied with. In the event of no local ordinance or law pertaining to fumigation operations, notification should be made at least to the fire department and recommend notifying the police department or any subdivision of the local municipal government that would have jurisdiction over fumigation operations.

12. All bedding and overstuffed material as well as absorbing articles such as woolens and furs should be placed for easy penetration and ventilation of the fumigant. It is recommended that the structure be heated when necessary to assist to drive the fumigant out of the materials. The use of fans or any other mechanical means of ventilation is recommended.

13. Extreme caution should be taken to make sure that all tenants are notified of the fumigation as to the time to vacate and when to reenter the premises. It is recommended that such notification should be made in writing to each individual or a notice being posted in a conspicuous place in the building.

(Continued on page 25)

The Pest Thysanurans of New England

By HARVEY L. SWEETMAN, *Massachusetts State College*

THERE are three species of closely related thysanurans commonly found in homes in New England. These are the silverfish, *Lepisma saccharina* L., the firebrat, *Thermobia domestica* Pack., and *Ctenolepisma quadriseriata* Pack., a species that closely resembles and is easily confused with the firebrat. The habits and environmental requirements of the silverfish and firebrat are fairly well understood, but little is known of the biology of *Ctenolepisma quadriseriata.*

Description. The silverfish is the most slender of the three species and attains a length of nearly one-half inch (1.2 cm.) exclusive of the appendages. Freshly molted specimens are a dark steel gray or almost black in color with a metallic sheen, while specimens with the scales partially rubbed off may be much lighter in color. The dark pigment is entirely in the scales. Newly hatched nymphs are about 2 mm. long, milky white in color, and devoid of scales. The nymphs become clothed with scales in the fourth and later instars. The scales are lighter in color during the first few instars, but become darker with each molt until the dark color of the adult is attained in four to six weeks. The eggs of the silverfish are soft and white in color when first laid. Shortly after exposure to the air the color changes to yellow and finally to light brown within a few hours. Unexposed eggs do not become as dark as exposed eggs. The eggs when first laid are plump, but by the time the brown color is assumed they are likely to be somewhat shriveled.

The firebrat attains a length of about one-half inch (1.4 cm.) exclusive of the appendages. When well clothed with scales it has a mottled gray color, but beneath the scales the body wall is a light yellow, which shows when the scales are rubbed off. Newly hatched individuals are about 2 mm. long, milky white in color, and devoid of scales. The nymphs are clothed with scales in the fourth and later instars. The coloration of the scales gradually darkens during the early instars. The eggs of the firebrat are soft, white, and opaque when first laid although the shell is transparent. The shell soon hardens, becomes tinged slightly with yellow, and the opacity of the egg usually increases. The eggs typically are elliptical in shape, but may be bean-shaped or roundly pointed at one end. They are about 1 mm. long and 0.7 mm. wide in the greatest dimensions. The shell of the freshly laid egg is smooth and devoid of sculpturing.

Ctenolepisma quadriseriata does not have any common name. it is the largest of the three species and attains a length of about five-eighths of an inch (1.6 cm). It is darker than the firebrat, being tannish-gray in color, and as the specific name implies has four lines extending lengthwise of the body. It is somewhat flatter in appearance than the firebrat. Newly hatched nymphs are devoid of scales. After becoming clothed with scales the nymphs appear slightly darker in color than the adults, but after a few instars they take on the tannish-gray coloration of the adults. The egg resembles that of the firebrat.

Habitat. All three species inhabit houses, but their responses to physical conditions tend to keep them in different portions of buildings.

Silverfish are very sensitive to moisture and for that reason keep to the more moist portions of buildings, usually in the basement, on the ground floor, near the foundations, or around water and drain pipes where conditions may be moist. This does not mean that they will not make excursions for food to other portions of the house, but they spend the greater portion of their time near the moist areas. In midwinter, when heated buildings become dry, they are more restricted in their movements than in midsummer when conditions are more moist. Silverfish can maintain themselves in warehouses and storage rooms, if temperature conditions are suitable during the winter. This probably accounts for their accumulation in stored materials and subsequent transportation to various destinations. Apparently they cannot maintain themselves in natural environments, at least in temperate regions.

The firebrat is very sensitive to temperature and is restricted by temperature more than moisture. Consequently firebrats are usually near the heating units, fireplaces, or heat pipes. However, moisture conditions are important also, and for that reason they may avoid hot portions of buildings because of dryness. Since they can withstand high temperature, feeding forays may be made to hot as well as cool portions of buildings. The firebrat is never found in natural environments, in fact, it is confined to buildings or places heated by man, at least in temperate regions.

Ctenolepisma quadriseriata apparently does not show such definite responses to temperature and moisture as the other two species. Nevertheless it confines itself to certain portions of buildings. During the summer it may be seen in attics and walls and even outdoors on the roofs and walls, but at night may forage inside the buildings. This species may be very numerous in attics and walls and apparently not be observed in the rooms, although the occupants of the house are aware of its presence. Ctenolepisma has been observed in natural environments in the vicinity of buildings. Present knowledge of its habits and environmental requirements suggest that it may be able to maintain itself independent of the habitations of man.

Food Habits. The food habits of these three species appear to be very similar. A wide variety of foods are eaten. Cereals, particularly those containing protein, are attractive foods. Starch alone has little attraction for them if other food is available. They are attracted to dead insects, freshly dried lean beef, and similar materials, indicating a need for foods rich in protein. About homes they have been observed to feed on fungus, dead insects, crumbs from the table, food on pantry shelves, wall paper paste, bookbindings, paper, especially paper containing sizing, etc.

Physical Environment. The silver fish does best in temperature environments ranging from 72° to 82° F. Reproduction drops off sharply above and below these temperatures. The maximum temperature at which it can maintain itself is near 88°, the minimum is much lower, probably

near 64°. However, it can maintain itself in buildings that have temperature below 64° in winter, but which become considerably warmer in summer. Reproduction occurs in moist situations from about 75 to 100 per cent relative humidity, with optimum moisture conditions being near 85 to 90 per cent. Newly hatched nymphs are much more sensitive to the physical environment, especially moisture, than later stages. However, they cannot withstand wet conditions, which may explain their inability to survive in natural environments, subject to wetting from precipitation.

The firebrat is well named; the common name having been applied because of its habit of living about outdoor bake ovens in England. The optimum temperature is near the blood temperature of man, 98.6° F., but oviposition takes place from 90° to 106°. While they can withstand high temperature of 120° or more for a few hours or even days, they are incapable of maintaining themselves above 106°. They remain active far below 90°, but the species cannot maintain itself below that temperature. The firebrat originally must have been a tropical species, as it requires high temperature in order to maintain itself. They prefer moisture conditions ranging from 85 to 90 per cent, but can maintain themselves in relative humidity ranging from near 50 to 97 per cent.

Ctenolepisma quadriseriata does not seem to respond so definitely to the physical environment. Apparently it prefers a temperature of 80° to 85° F., but can live and even reproduce in temperature conditions considerably above and below its optimum requirements. It seems to have moisture requirements similar to that of the firebrat.

Life History. These Thysnaura have been reported to have long life cycles requiring two to three years for development. This is now known to be untrue.

The silverfish will mature and reproduce in favorable conditions in three to four months. The eggs are deposited in crevices and similar places if such are available, but may be placed in debris of many sorts. The oviposition period extends over many months with only one to four eggs being deposited per day. Many days may pass between periods of oviposition. An average of about 100 eggs is laid in temperature conditions of 72° to 82° F. The eggs of the silverfish hatch in about 27 to 28 days in optimum environments, but only 19.5 days are necessary at 90°, while 43 days are required at 72°. The nymphs develop rapidly in favorable conditions and reproduction may occur when three to four months old. The first instar lasts about three days, but the following instars gradually lengthen until the adults molt about once a month. Molting and growth continue in adulthood; sometimes the length doubles after the first eggs have been laid. The usual length of life under natural conditions may be expected to be about two to four years.

The firebrat will mature in two to four months in favorable environments. The eggs are usually placed in crevices or debris, but are much more likely to be left in the open than are those of the silverfish. The eggs are laid in batches of only a few to as many as 45. Batches of eggs may be laid in successive instars or at more infrequent intervals. The average number of eggs per female is probably somewhat under 100. The eggs hatch in 12 to 13 days under optimum conditions, but require about 75 days at 75°, the minimum temperature at which the eggs hatch.

(Continued on page 25)

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Recent Advances in Entomology of Interest to PCOs

By GEORGE E. GOULD, *Purdue University Agricultural Experiment Station*

IN THE *News Edition* of the American Chemical Society published January 25, 1941, Dr. C. H. Richardson of the Iowa State College has a review entitled "Advances in Entomology," in which he briefly summarizes recent articles, principally those published in 1940, on new materials and new applications of insecticides developed for use in insect control. Since a number of these articles are of interest to Pest Control Operators, a brief summary of these items is presented here. A bibliography of the articles is given so that the original article may be consulted if more detailed information is wanted.

Cheng and Campbell[1] of Ohio State University have made a careful study on the insecticidal action and toxicity of yellow phosphorus in the control of cockroaches. The median lethal dose of phosphorus for the large American roach by mouth was determined as 0.02 mg. per gram of body weight, and by injections as 0.04 to 0.08 mg. per gram. The median lethal dose is defined as the quantity of material required to kill 50 per cent of the test animals and is expressed in milligrams required per gram of body weight. Phosphorus was much more toxic than sodium arsenite or sodium fluoride when the latter were fed in the same viscous median. The German roach was less susceptible to phosphorus in a diluted paste with a M.L.D. (median lethal dose) of 0.13 mg. per gr. This larger M.L.D. cannot alone account for the failure of phosphorus against this species in commercial practice, as the German roach does not imbibe paste as freely as does the American roach. The authors also indicate that phosphorus paste painted on the bodies killed the roaches and that in small closed space cockroaches were killed within 24 hours by the fumes of phosphorus. It is emphasized in the article that the killing power of phosphorus depends upon the particle size distribution of the suspended particles.

Recently considerable attention has been given to the use of phenothiazine for screwworm fly larvae and internal parasites of livestock. Bruce[2] has found that of the 29 compounds tested as medication for cattle to prevent breeding of the hornfly, rotenone was the most successful and caused no noticeable harmful effect. Such medication given by mouth to cattle prevented the breeding of hornflies in the droppings. Phenothiazine and two other compounds were also effective but were either distasteful to the cattle or produced some harmful effect. O'Kane and associates[24] of New Hampshire tested a number of compounds to determine their penetration into the insect integument (body wall). In their conclusion the authors suggest that the wax-solvent properties and the size of the molecule, among other things, affect the speed of penetration.

Hockenyos[13] believes the integument of the American roach has the properties of a semipermeable membrane coated with a film of water-resisting fat or oil, and that the rate of absorption of sodium fluoride by the integument is influenced by osmotic forces, by temperature, and by chemical materials that absorb or react with this film.

In a paper on contact insecticides for the bedbug, Hockenyos[15] discussed diamylphenol, a relatively new insecticide. Using the falling mist method in the laboratory this compound gave rather poor results; however, Jennings[21] found it one of the most promising contact insecticides tested by him for controlling carpet beetles.

"Well, I told you not to have that hunk of cheese tattooed on your chest!"

—Reprinted through courtesy of The Farmer, St. Paul, Minn.

Husen[18] has studied the staining of wallpaper by insecticides made with petroleum-base solvents which are commonly applied in dwellings. All petroleum-base solvents examined produced the staining effect and toxicants added to solvents slightly intensified the degree of staining. Starch-type papers showed the most pronounced staining while moisture increased the degree of staining.

Hursh[17] of Ohio State University in a study of sprayers found that the mechanical performance of a sprayer depends upon the construction of the orifice and the dimensions of the cylinder.

Hockenyos[14&16] states that such physical properties of soils as capillarity, adsorption, size of soil particles and moisture content, influence the effectiveness of soil poisons in termite control. Among the older poisons are orthodichlorobenzene, monochloronaphthalene, anthracene oil creosote, betanaphthol, sodium arsenate and sodium arsenite. Of the promising newer materials trichlorobenzene, pentachlorobenzene and tetrachlorophenol are noteworthy, while diphenylamine, acid lead arsenate and borax are still being tested.

For Lyctus powder post beetles Christian[3] suggests the use of an aqueous solution of borax for green lumber as it is cut. Lumber enroute to the consumer may be treated with a solution of pentachlorophenol in light fuel oil. Methyl bromide fumigation was effective in loosely stacked lumber. Nettles[20] has devised a method of treating green fence posts with an aqueous solution of copper sulfate which renders wood immune to termites and rots.

In tests of insecticides of plant origin, Goodhue and Sullivan[5] tried the smoke from a burning mixture of derris, cornstalks and sodium nitrate on houseflies in a Peet-Grady chamber. Derris proved to be 10 times more toxic than pyrethrum burned in the same manner. Derris smoke also killed the bean aphid, but failed to have much effect on the American cockroach. Haag and Taliafeno[12] have tested cubé on rats and found that an acute median dose by mouth was 170 mg. of cubé containing 4.7 per

cent rotenone while as much as 300 parts per million fed daily in food did not affect the growth of the animal.

Weed[27] has presented some information on the deterioration of pyrethrum powder in storage. Pyrethrum powder with an initial content of 0.5 to 0.6 per cent pyrethrins lost 9 to 16 per cent in six months, while powder containing 1.1 per cent or higher initial content lost 14 to 20 per cent. Loss increased with advancing age but the rate of loss became progressively less. Samples 10 years old or older may still contain as much as 0.42 per cent pyrethrins.

Hellebore is another plant product that has long been used as an insecticide but the variability of samples has reduced the demand for it. Fisher[7] of Iowa State College has found that the ether and water soluble alkaloids of American hellebore were definitely toxic, while the whole powdered drug and the insoluble extractives were low in toxicity. Against the American cockroach the total alkaloids were five times more toxic than arsenic trioxide and when incorporated into a talc dust were toxic to the German roach.

Among the fumigants, methyl bromide has received considerable attention in the past few years. Shepard and Buzicky[28] have tested it against 15 species of insects and found the black carpet beetle the most resistant and the Indian meal moth the least resistant. This gas has a delayed killing action and killed at somewhat lower temperatures than that used for other fumigants. Flour treated with a dosage of two pounds per 1000 cubic feet did not suffer in baking quality. Irish et al[19] found that for short exposures animals will tolerate large doses, while longer exposures caused lung irritation. While definitely toxic to man, with proper precautions methyl bromide may be used without danger.

In a paper by Darkis, Vermillion and Gross[6] it was shown that rate of evaporation for paradichlorobenzene was less for large crystals and decreased at the lower temperature. The smaller the crystal size, the less pronounced was the effect of increased temperature on the rate of evaporation. The rate of evaporation was greater when the air came in contact with the crystals but diminished as the air became laden with paradichlorobenzene. A new method of determining paradichlorobenzene in the field has been developed by Roark and Nelson[25] and can be used by anyone with the proper equipment and some knowledge of chemistry.

A study of the toxicity of sulfur dioxide to various stages of the bedbug has been made by Gough[9]. The egg was the most resistant stage, while well-fed adults the least resistant. Starved nymphs and adults were more resistant than recently fed insects of the same age. Apparently the starvation of nymphs for long periods made them as resistant as the eggs to this gas.

Granett[10&11] of Rutgers University has studied various mosquito repellents and found the following mixture the most efficient: Diethylene glycol monobutyl ether acetate and diethylene glycol monoethyl ether 65 per cent, alcohol 28 per cent and corn oil 7 per cent. The mixture was free from injurious properties as ordinarily used and gave good protection from blackflies, sand flies, stable flies, deer flies and chiggers as well as mosquitoes.

Standardized biological methods for testing insecticides especially against household pests are receiving much attention. Murray[22] questioned the validity of the Peet-Grady test on flies as he claimed that a uniform

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dosage per fly is not possible in the test as now used. Weed et al[28] discussed the relation of moribund to dead houseflies resulting from Peet-Grady tests of insecticides which contain rotenone and other slow acting materials, and the effect of this delayed mortality on the evalution of the spray.

Methods for proposed tests against roaches and bedbugs have been developed[1] and methods for carpet beetle testing[2] and moth-proofing are now being studied. Jaretzky and Janecke[20] propose a method of evaluating insecticides based on the use of ants as the test animals. The materials were placed directly in a sand mixture and since the insects were placed on this mixture, the action was measured by the contact effect.

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The Control of Human Lice Under War Conditions

By G. J. SPENCER, *The University of British Columbia*

AS ALWAYS happens during wars, outbreaks of body and crab lice cause concern to medical officers in the army and various, but rather inconvenient, control methods are in use. Where the standard British Army machinery for applying heat is available for body lice, control is simple enough, but such machinery is not available among the widely scattered units of our citizen army. On the point of embarking for France during the last war, a chance-met English officer emphasized to me the importance of lice and recommended lavender oil, procurable at the time anywhere in England at one shilling per ounce, for their prevention and control. The first time over I took an ounce vial and on my first leave and thereafter a four-ounce bottle of this oil. Rubbed on the ankles, neck, wrists and waistline, it certainly seemed to deter body lice whose establishment, on the few times that they escaped the lavender oil barrier was prevented by my using silk underwear. Application of the oil to lice in the seams of clothing killed them very quickly. I always carried a stock for my troops and while the smell sometimes laid them open to merciless chaffing, they were never lousy for long.

With the recruiting of large numbers of men in Vancouver during the war, I was consulted about outbreaks of body and crab lice on the troops. The army formula prescribed for body lice, which had already been put into force on a platoon of men, was a marvel of archaic ideas dating apparently from the crimean wars and consisting of a combination of all methods recommended since that time. Its publication here is forbidden me on the plea of military secrecy and thus a gem of insect control is lost to the entomological world. To my amazement, there were no casualities among the troops who had been treated.

In place of these military methods for body lice, I recommended the use of derris powder, dusted and rubbed into the seams of all underwear and uniforms. The sanitary sergeant told me that the powder caused no irritation to the men and there have been no complaints since about this species. It has not been possible for me to conduct personal tests against this insect but from long experience with derris in the control of lice on dogs and fleas on cats and dogs, I would say that it should provide complete control and its avaliability, convenience of storage and transportation, and ease of application should recommend it for this purpose.

For crab lice I recommended the mosquito repellent Sta-way, which is reported by Phillip Granett in the Journal of Economic Entomology, June, 1940, page 566, as consisting of diethylene glycol monobutyl ether acetate, diethylene glycol monoethyl ether, ethyl alcohol, corn oil and perfume. It is prepared in this country by the Canadian National Carbon Company and can be procured from any drug store, costing locally 35 cents for a two fluid ounce bottle. The sanitary sergeant reported satisfactory control with this liquid and brought over an infested soldier for my inspection. Applied with a piece of cotton wool or an old shaving brush so as to reach the roots of the hair, Sta-way causes crab lice to loosen their hold and to fall off within a few seconds and to die very shortly. Over-enthusiastic application so that the liquid runs down over tender skin produces only temporary tingling as occurs with the use of shaving lotion, and no subsequent ill effects. Inducing the patient to stand over a sheet of paper and to watch the insects fall increases the popularity of the treatment. I supplied the liquid free for the privilege of retaining duplicates and the man departed with the air of having conferred a benefit upon mankind. Sta-way now constitutes a regular part of the army medical equipment in this area for use against crab lice; it should prove equally effective against head lice.—Reprinted from The Canadian Entomologist, January, 1941.

Troubles

They are a fairly universal commodity, these days, but to some people they come in unique forms. Fireman Peter Bradley, donning his boots to answer the first fire alarm in five months at Camden, S. C., found that a rat had taken up residence in one of them and raised a family.

Odyssey of Rats in Exile Revealed

German Wheezing Strain that Geneticists Value Sent Here from England for Safety

The odyssey of a unique strain of rats, driven a quarter of the way around the world by the spreading power of Adolf Hitler, was revealed recently in Columbia University's genetics laboratory, where the small refugees found a stopover in a flight that began in Berlin with the advent of the Nazi regime.

Two males and four females of a strain valued by geneticists for a hereditary quirk that makes 25 per cent of the offspring wheeze and whistle when they breath arrived at Columbia almost two years ago while Europe was jittery over the Munich crisis. They came from London, where fear of air attacks had impelled Professor J. B. S. Haldane, the British scientist, to send them for safekeeping to Professor Leslie C. Dunn.

As the European situation darkened, Professor Haldane grew more anxious over the safety of the little animals, which were multiplying rapidly in their cages at Columbia and producing varieties that included a pink-eyed type with pale fawn fur known to the British fanciers as lilac.

"Haldane sent me another letter about the rats," Professor Dunn recounted. "He said: 'I wish you'd ship them farther west. I don't feel very happy about them in New York.' So I sent a consignment of them to the University of California at Berkeley."

The shipment to the West coast was followed by others to the University of Illinois and Pennsylvania, a private school in Connecticut and Columbia's College of Physicians and Surgeons at the Medical Center. Professor Dunn retained a group of the rats on Morningside Heights. In spite of a brief life-span for those that inherit the wheezing infirmity, there have been more than 1,000 births in large litters so far.

It all began in the Kaiser Wilhelm Foundation for Brain Study in a suburb of Berlin, where a German scientist was breeding the rats when Hitler came to power. He took some with him when he fled to London. At Columbia the specimens have been under the care of another German refugee, a young woman embryologist.

Professor Dunn explained that the rare, freakish animals were useful for insight into heredity and embryonic bone development of mammals. He said he had received other shipments of valuable specimens for safekeeping, including mice and fruit flies.

While at Columbia, he disclosed, the rats have developed another peculiarity in addition to the thoracic stiffness that causes their breathing to approximate hiccoughing. Some of them, he said, were born without tails.

Can Do, No Can Do

Sirs:

How about a bit of pidgin English? Sometimes it is very expressive, as you well know. When in Yunnan recently, I asked a Chinese what he thought of things generally in the world. Being a businessman rather than a scholar or an official and having come from South China he replied in pidgin English "Belly bad. Can do, no can do, what fashion?" which translated into good Shakespearean English reads "Very bad. To be or not to be. That is the question." In Hong Kong, I asked a Chinese what the Chinese thought of the Japanese. He replied "Chinaman think Japanman no got proper savvy box." I notice the American public has been indulging freely in Confucius sayings. How is this one? Confucius says Chinese read from right to left, while American read from left to right. American say "hell-o," Chinese say "O-hell."

—JULEAN ARNOLD.
U. S. Commercial Attache.
Peking, China

P.S. Discovered a new, very savory Chinese dish while in Hong Kong. Take six newly born mice, with eyes still closed and nice and pink. Hold each by the tail while stirring in rich batter, then fry. While piping hot dip in cold honey until completely covered, then insert entire morsel in mouth and leisurely devour. It should be preceded by a Mow-tai cocktail and followed by two bai-gars.

—*Time Magazine.*

PESTS likes the Chinese better than their appetizers.—Ed.

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Business and Conditions

WE HAVE REACHED the breathing spell that always follows in the wake of a national election. The turmoil of the political campaign has subsided. What we have done belongs to the irrevocable past. What we are going to do lies with the future. The time is particularly opportune for considering where we stand and what is ahead of us.

At the outset there is one important fact to be kept in mind. The problems we faced before November 5 are still before us. By the elections we have registered, in very general terms, certain convictions. We have said what we *think* about things but we have yet to decide what to *do* about them. The plans we have in mind are still to be carried out. The obstacles with which we are confronted are still to be surmounted. Our job, in other words, is still to be done. We cannot afford to sit back complacently and take for granted that our troubles are over.

What that job is we all know. We must, first of all, build up our defenses to protect ourselves against the destructive forces which are menacing civilization and turning the world into a shambles. At the same time, we must meet as adequately as we can the needs of 130 million people and maintain as far as we can the living standards which have become the measure of American achievement.

To do both of these things is going to be a colossal task. It means that we must redouble our efforts, that we must utilize to the fullest possible extent our resources, that we must all put our shoulders to the wheel. It means that we must step up our productive activities not only to supply the facilities and equipment required for our protection but also to supply the things we must have if we are not to slip backward toward a primitive existence in which war will become our chief preoccupation, as it is now the chief preoccupation of totalitarian states.

This cannot be done by holding elections. Votes do not make tanks or planes or provide us with bread and butter or houses to live in. We cannot achieve security merely by declaring our intention to make ourselves secure. It is one thing to decide upon the job to be done. It is quite another, as we are now discovering, to do it. Many days, even years, of toil will elapse and prodigious sums of money will be spent before the task is ended and the plans we have drawn have been carried out.

We have, for the moment at least, rung down the curtain on politics. Business — productive enterprise — must now take the center of the stage. The plans must be executed. The power must be turned on. The goods must be delivered. The time has come when we must concentrate upon realities, not theories, remembering that economic facts are neither Democratic nor Republican.

Obviously, productive effort must play the stellar role in the great undertaking upon which we have embarked. Industry is the fountain-head of the many things we need whether they are to be used for defense or for maintaining our way of living, and industry, in this case, does not mean only the large highly organized corporate enterprises. It means business of all kinds, large and small. It means the farmer, the storekeeper, the worker, the employer, the banker,—all of us who are engaged in one way or another in productive effort.

The question of the moment, therefore, is—How is business to do the job? How is it to employ most efficiently the vast resources at our command? How is it to turn out, with the least possible delay, the things we need? How is it to earn the income out of which the bills for national defense and the expenses of running the government are to be paid?

The answer to these questions does not lie with business alone. The conditions under which it operates are prescribed, up to a certain point, by government. Government has undertaken to formulate rules which business must follow. It levies taxes which business must pay. It lays down methods by which workers are to be employed and wages are to be paid and how capital is to be invested. It attempts, by direct competition and by indirect regulation, to fix price levels.

All of these conditions and limitations and regulations may or may not serve a laudable purpose. That is not, at the moment, the test by which they are to be justified. What concerns us above all else, here and now, is whether business is going to be able to do the job that lies before us, whether our industrial machinery is going to carry the peak load put upon it by the emergency we face. If it fails, government itself must shoulder at least a part of the blame.

Certainly, if business is to be held accountable for doing the job, it should have something to say about how it can best be done. It has not only the right, but the responsibility, of bringing to public attention and to the attention of government itself the difficulties under which it is compelled to operate and the obstacles it encounters, regardless of where or how these obstacles originate. The important thing is to get productive enterprise going at full speed, to take up the slack in employment, to increase the national income and to place upon an enduring basis a national economy strong enough to withstand the stress and strain to which it will be subjected. To do this we must have unity of purpose but to have unity of purpose we must first have unity of understanding. We cannot compose our differences and reconcile conflicting convictions if we do not know what they are.

It is, therefore, an obligation on the part of business to explain to government why and how the course we are following is achieving or failing to achieve the important purpose at which we are aiming. It is equally an obligation of government to listen. It is the obligation of both to put aside partisan prejudices and partisan interests and face squarely the facts before us.

In this case, government is the Congress of the United States. It is

the agency set up to carry into effect the popular will. If it is to act wisely and fairly and constructively, it cannot have too much information or too many facts about the job to be done and the methods of doing it. We cannot wait until election day to tell the members who represent us what our troubles are and what we have in mind, but we can tell them without resorting to the cumbersome electoral machinery by talking to them and writing to them. In this respect, every day is an election day. It is another—a continuous method of exercising the right of franchise. The need of it, from a practical viewpoint, was recognized by the founders who set up the constitutional machinery under which we, as a nation, operate.

The more adequate the understanding is between Congress and business, the more each takes into consideration the other's point of view and the other's problems, the nearer we shall be to that unity of effort and singleness of purpose which we now need so badly.

We have both the resources and the resourcefulness to do the job ahead. The capacity of American business to produce is greater than that of any other country. All that is needed is to make the most effective use of what we have. We cannot afford to fail to *do* things for lack of *knowing* what ought to be done. It is a situation which calls for candid, honest, constructive criticism. That is essentially a democratic method of procedure. If we follow it conscientiously, we need have no fear of the outcome.

As James S. Kemper, President of the Chamber of Commerce of the United States recently said: "I hope that in my effort to be realistic about the problems which lie ahead, you have not gained the impression that I am pessimistic. Admittedly, the problems are serious; admittedly they will require the intelligent effort of every thinking American if they are to be solved. But I have faith that the spirit of the people will rise above and conquer the difficulties that beset us."

Public Spending and National Debt

When the new Congress convenes in Washington, shortly after the turn of the year, it will find on its doorstep a question of far-reaching importance, the answer to which may profoundly affect our national destiny.

It is not a new question nor a very interesting one. It holds out no possibility of great deeds to be done or spectacular achievements to be attained. In some respects it is very complicated; in others it is very simple.

It is this:—"When and how is the Government of the United States to pay its bills?"

Bill-paying is not a very inspiring or pleasant preoccupation. All of us — Congress included — would much rather spend money than earn it. Unfortunately we cannot, for long, do the one without doing the other. They go hand in hand. To that rule there are no exceptions. There is no way by which we, either as individuals or as a people, can escape the drab day of reckoning when the columns are totaled and we find ourselves "in the red."

Here are some of the disturbing facts we now face:

For ten consecutive years the Government of the United States—for which we, the people, are accountable —has been living beyond its means.

It has been given, in the form of taxes, more money to spend than ever before in time of peace and it has

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been going into debt faster than ever before.

It now owes 44 billion dollars and, at its current rate of spending, will owe close to the present 49 billion dollar debt limit by June 30, 1941.

If it goes on as it has been going, it will owe, three years later, more than 60 billion dollars. Indeed the Secretary of the Treasury proposes that the debt limit now be raised to at least that amount, on the grounds that the 11 billion increase may be needed in the next year.

This is bad enough without looking farther into the future. Nevertheless, the possibility that we might become involved in the war, as an active belligerent, is not altogether remote and we cannot go to war on a shoestring. If that should happen, the heights to which the federal debt might soar must be left to the imagination.

We cannot very well shrug our shoulders and regard our collossal expenditures as inevitable because we must build up our defenses. As a matter of fact, we have only begun to spend for defense. Of the 13 billion dollars the federal government is costing this year, only 5 to 6 billions will go for defense outlays. About 7 billions will go for normal operating expenses.

Add to this what our state and local governments—for which we are also accountable—are spending and we find that government is running up bills at the rate of 17 billion dollars for ordinary—not emergency—purposes.

These are big figures but it is not altogether the bigness of the figures that counts. Ours, it must be remembered, is a big country. If you had an assured income of a million dollars a year, you could take a chance on running up a sizeable debt which would mean bankruptcy for one with a more modest income. The real test is not how big the debt is but how big the current resources are out of which we expect to pay it.

There is also another factor to be reckoned with—our credit standing. In other words, are we in the habit of paying our bills or letting our creditors do the worrying? There is no reason to believe that we, the people of the United States, do not intend to make good the I.O.U.'s of our government, but the trend is disturbing. If a government has been going "into the red" for ten consecutive years and now finds that it must go "into the red" for several years longer, to meet an emergency we did not anticipate, isn't it about time that we, the people, began to think about where it will wind up? And, isn't it about time not only that we began to *think* about it but also that we suggest to Congress that it *do* something about it?

What, you may ask, can Congress do?

The answer is simple. In your own case, if you find yourself in a similar predicament, you can work harder and earn more or you can spend less —or both. The same rule applies to Congress, which is your agent. It can take certain steps to enable us to earn more by working harder, thereby increasing the income out of which taxes are paid, or it can spend less by cutting down appropriations for projects which are unnecessary or can be postponed—or both. It will probably have to do both, if we ever expect to burn the 45 or 60 billion dollar mortgage it has placed upon our productive resources.

The source out of which the bills of government are paid is the earnings of the American people, not, as many suppose, their wealth. Houses are wealth. Automobiles are wealth. But tax bills cannot be paid with houses and automobiles. Taxes must be paid in money, or income, and idle factories, idle shops and fallow fields do not produce income.

If you can double your income by working harder and longer and producing more, you are on the right road to solvency. If, as a people, we can double our income, our government is on the right road to solvency. To put it simple, a national income of 100 billion dollars will yield twice as much revenue for the government as a national income of 50 billion dollars without increasing by one penny the rate of taxation. To increase the income by borrowing money and spending it is much like taking it out of one pocket and putting it in another. By that route, we wind up where we started.

To increase production, then, by working harder and producing more is the first and most effective method of putting ourselves in the way of paying our debts. But that is not the only way. We must, at the same time, keep a watchful eye on our spending. We must go without some of the things we *would like to have* and confine our buying to the things *we must have*.

Many of the things for which the Federal Government has been spending money are desirable. You and I, individually, would probably like to have a new car or a fur coat or take a winter vacation. The question, however, is not whether we *would like* it but whether we can *afford* it. That question applies as well to government. We would like to have it provide us with comforts and conveniences and protect us against want and give us security, but that is all going to cost money—a prodigious amount of money—and we shall have to determine, sooner or later, whether we can afford them.

Cutting down expenses is not a pleasant task. In Congress "watch dogs of the Treasury" are usually about as popular as any other kind of watch dog. We don't like to have people tell us that the cash drawer is empty and we have overdrawn our account. But that is the predicament we face. If we keep on facing it without doing anything about it, we shall find that instead of promoting our security, we have been undermining it. Instead of realizing our high hopes, we shall receive the brief notice—"no funds."

The citizens should now demand that the acid test be applied to all government expenditures. It is not sufficient that the expenditure may be *desirable*. The test should be whether it is *necessary*. Rigid application of this test would materially reduce the cost of federal, state and local government, without interfering with its efficiency, and would place us in a stronger financial position to bear the burden of national defense.

Yellow Electric Globe As An Insect-Repellent Lamp

G. H. Bradley and B. V. Travis, of the New Smyrna, Fla., laboratory, Bureau of Entomology and Plant Quarantine, have tested a yellow electric-light globe (advertised as an insect-repellent lamp) in a light trap in comparison with a standard white light. Collections over a period of eight nights in which the globes were interchanged, gave almost identical number of the three principal species of pest mosquitoes with the two lights. The total volume of other insects taken was slightly greater with the yellow light.

—*C. P. Institute.*

British Export Fancy Mice

London—Fancy mice in a variety of colors are being bred in England for export. They run black, white, chocolate, blue or in broken colors and can be trained to do all sorts of amusing tricks.

Even women have taken up the training and breeding of mice as a hobby. They experiment with shades and combinations of colors. Despite the war, they can obtain breeding stocks and advice on color heredity from pet shops, and the business is not discouraged because the exports provide Britain with foreign exchange.

—*N. Y. Evening Post.*

Anent Termites and Phoney Stories

UNDER date of April 5th there appeared in the Chicago Herald-American a science story by a school girl which story won her a $5.00 prize. It would seem that the pest control business must lend itself to a lot of unusual stories. The public seems to want to read about the weird, and the pests we deal with seem to supply such unusual material.

We quote from the story dealing with termites together with a sequel by a very prominent scientist and authority on the general subject of termites.

A portion of the story follows:

"I was utterly stunned to hear our teacher tell us a true story which occurred a few years back in Brazil where these 'white ants' were the cause of a tragic death of an American scientist's assistant on research work there. The teacher's story was confirmed by a newspaper clipping relating the events in detail."

Professor Thomas Peine, an American scientist, was then in the Brazilian jungles carrying out his scientific research on the habits and customs of the termites, or "white ants." One day in discarding his burning cigaret, Mr. Peine observed it had fallen on a nest of termites. He stopped to watch their reaction to fire. At first they scattered in all directions as if fleeing the imminent danger, but in the next moment they returned with systematic and planned defense of their nest. They surrounded the burning cigaret and began to excrete acid from their glands, and thus in but a few minutes the flame was extinguished.

Other experiments followed in which Mr. Peine threw larger burning objects on the nest of the termites. In each case the insects defended their nests fiercely and with great sacrifice. They did not only try to put out the flames by exuding their glandular acid, but in many cases threw themselves into the flames. Many of them perished, but the flames in every case were always extinguished.

Professor Peine's assistant, a young native Indian, was also carrying out these same experiments on his own account. In his repeated endeavors to set on fire the termites' nest, he weakened its foundation so much that one night when out to carry on his experiment, he fell into a hole which was wormed out by these insects. His frantic calls for help brought Professor Peine and other members of this expedition to his side.

They found the young man up to his neck in a hole. His entire body was covered by swarms of these insects. His efforts to extricate himself from his confinement were futile. The termites covered his face and neck, entered his nose, eyes, mouth and ears. The onlookers tried in vain to save the victim. Fire, water, sand —all this was to no avail. In fifteen minutes the victim expired in the greatest agony."

(Continued on Page 18)

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On reading this, a very eminent scientist says:

"The clipping . . . about termites extinguishing a burning cigarette by acid from their glands has been received. Termites have in their heads a gland from which an aciduous secretion is exuded. This chemical is used in defense when ants raid their nests.

"My general reaction to the newspaper story is that the facts have been greatly exaggerated. Termites in the tropics, however, do bite, but that they could kill a man by covering him does not seem possible."

The moral to this whole thing is that we must be able to separate the facts from the fantastic. We, as operators, must not be guilty of passing on stories to our public which might be challenged by a man of science. Let us adhere strictly to the facts which our study of pests in our locale has proven to be true.

"ANT-ICS"

Lucy Pope Cullen has written a book, "Beyond the Smoke That Thunders" (Oxford). She loved the Rhodesian bush, in the new copper country up on the border of the Congo, which she describes as a strange, dry, flat country, endlessly flat, the flatness interrupted only by weird flat-topped trees and towering ant hills. The ant hills were everywhere, and they grew over night. When the mill was under construction a motor disappeared. It had been checked in but it couldn't be found; and it had been a four-foot cube in its packing case, heavy enough to require a derrick to lift it. It wasn't located for months, and when it was discovered it was under an ant hill, in the storage yard, precisely where it had been unloaded. Over night the white ants had adopted it as foundation for a nice mud-cemented ant hill, and since, the yard was full of other and older ant hills, no one suspected this one of concealing a four-foot cube of motor. When investigated the packing case had been eaten away but the motor was sound.

Once Lucy Pope, weighing 106 pounds at the time, leaned against a good looking tree in her back yard. It collapsed; the ants had eaten it hollow. They ate her husband's golf clubs, and her own set of the works of O. Henry; their taste was catholic. As the mining town developed, esthetic citizens built rock gardens on the ant hills, one lady built a tea house atop an ant hill. In the early days most of the community lived under corrugated iron, which, at least, was ant-proof.

Rat Leaves Marks on Baby's Scalp

Cameron, Mo.—James Clifford Kirkendoll, 2½-month-old son of Mr. and Mrs. James Kirkendoll, of Cameron, has two marks on his scalp, the imprints of a rat's teeth. He was bitten on the head while asleep in his crib. At 2 a.m. the parents heard the child cry out. As they rushed to the crib they heard the rat jump to the floor and scamper away.

Discussion of the Hazards Associated with the Use of Methyl Bromide as a Fumigant

IN ORDER TO provide safe methods of application of methyl bromide as a fumigant, the Division of Industrial Hygiene of the National Institute of Health prepared and issued (May 1938) preliminary recommendations to fumigators for the use of methyl bromide (see below). These recommendations were of a preliminary character, based not only on experimental findings of studies of methyl bromide but also on experience with other toxic gases and particularly other fumigants. These preliminary recommendations were occasioned by one fatality and several cases of illness of a serious nature arising from inhalation of methyl bromide during or after commercial fumigation. The application of these precautionary measures during the past 2 years has apparently been helpful in preventing serious illness, since no new cases have been reported. The cooperation of the United States Department of Agriculture and the principal manufacturers of methyl bromide in insisting that safe methods be employed in the use of methyl bromide has resulted in the proper application of this fumigant.

Preliminary Recommendations For Use of Methyl Bromide as a Fumigant

1. Avoid breathing air containing methyl bromide.

2. On completion of fumigation provide thorough ventilation for cars, rooms, or buildings before entering.

3. When necessary to enter spaces containing methyl bromide, use a gas mask provided with a canister giving protection against organic vapors, or a positive pressure hose mask. (Masks and canisters to be approved under United States Bureau of Mines Schedule 14D or 19A. Canisters, black, type B.)

4. Avoid spilling of methyl bromide. Get to fresh air immediately in case of spillage. Remove any clothing in contact with skin which has become impregnated with the liquid.

5. Post warning signs notifying that methyl bromide is being used and that the gas is toxic.

6. Containers of methyl bromide should be stored in a cool, well-ventilated place, outside inhabited buildings. Avoid leakage by seeing that valves on cylinders are tightly closed.

The maximum concentration now used in commercial fumigation procedures is about 2½ pounds of methyl bromide per 1,000 cubic feet (40 mg./l. or 0.95 per cent by volume), with concentrations ranging as low as 1 pound of methyl bromide per 1,000 cubic feet of space to be fumigated. Experimental studies with animals by Sayers et al. (1929) have indicated that a concentration of methyl bromide of 0.2 to 0.4 per cent by volume is dangerous for a 30-60 minute exposure, while as little as 0.005 per cent by volume has produced slight symptoms in animals after prolonged exposure. Recent work by Irish et al (1940) has shown that repeated exposure of experimental animals to low concentrations of methyl bromide causes the development of paralysis, which may terminate in death. Their findings indicate that rabbits exposed 6 hours per day for 6 months to a concentration of 0.13 mg. of methyl bromide per liter (34 p. p. m.) develop paralysis. At higher concentrations both rabbits and monkeys develop paralysis and soon die if exposure is continued. If the exposures are discontinued immediately upon the development of paralysis the animals often return to normal, exhibiting little or no signs of residual effects.

The method now in common use to test for the presence of methyl bromide in workrooms is that of some type of halogen lamp or halide leak detector. Findings in this laboratory, under ideal conditions of light and in the absence of air currents, show that the lower limit of this type lamp is about 50 p. p. m. of methyl bromide. At 50 p. p. m. a moderately strong positive test is seen. However, at 35 p. p. m. an unreliable test is given. Lower concentrations give a negative test. Thus it will be seen that as a test for dangerous concentrations of methyl bromide, especially where exposure is prolonged and repeated, the halogen test lamp leads to a false sense of security and it is

recommended that some more sensitive method be used, preferably some type of quantitative chemical procedure.

In man, symptoms caused by slight exposure to methyl bromide, as reported in the literature, include weakness, vertigo, and dyspnea. Often symptoms appear several hours after inhalation of the gas. In more severe exposures there may also appear psychic disturbances, attacks of mania, and transitory brachial paralysis. Double vision, amblyopia, and aphasia are likewise noted in certain nonfatal cases. Several fatal poisonings as the result of inhalation of methyl bromide while filling fire extinguishers in France are reported in detail. (See selected bibliography which follows.) In the United States two fatalities and several less severe cases resulting from exposure during fumigation have been reported.

The toxicity of methyl bromide when used as a fumigant has unfortunately been underestimated in some quarters, owing to ignorance of its toxicity as well as its lack of odor at the lower concentrations and the fact that it possesses no irritant properties. Although methyl bromide is less toxic to man than certain other fumigants in common use in the United States, careless handling and inadequate protective measures will unduly expose fumigators and other persons coming in contact with the fumigant. It is recommended that the precautionary measures that have been issued by the United States Public Health Service be adhered to closely. Copies of these recommendations will be furnished on request.

(This article appeared in the Dec. 6, 1940 issue of *Public Health Reports*. Those interested may obtain selected bibliography on methyl bromide which was appended therein by sending 5c in cash (no stamps) to Supt. of Documents, Washington, D. C.)

Why it is Hard to Kill A Cockroach

Philadelphia, Pa.—The secret is out as to why it is hard to poison a cockroach.

He carries in his stomach some parasites which like poison and eat it, to his great relief, the American Assn. for the Advancement of Science was told on December 28. By dyeing the parasites scientists found that there might be more than one kind, each a "specialist" in one sort of poison.

—New York World Telegram.

Sales Tips

"SORRY—I'M BUSY"

Have these words ever greeted you when you walked into a prospect's office? They probably have—because, as often as not, your customers and prospects are busy at the time you drop in on them.

Sometimes, of course, this "I'm busy" greeting is simply to stall you off. But regardless of the motive behind it you are not in a position to ask questions.

If you let your prospect say "Sorry—I'm busy," you must accept the unspoken conclusion of his remark—"you'll have to drop in again some other time when I'm not busy."

But—and here's a mighty important "but"—you can prevent your prospect from saying "Sorry—I'm busy"—by saying it for him!

You see, whenever a prospect has the opportunity to tell you how busy he is, the mere telling of it makes him feel all the busier. But you can get the jump on your "busy" prospect by saying to him:

"I had something mighty important to take up with you, but I see that you are busy this morning."

If you tell him he is busy, he won't be so busy as he might be if he tells you. A man usually appreciates being recognized as "busy." Try it the next time you run into a "busy" prospect—it will go a long way toward getting you that all-important interview.

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Pyrethrum In Medicine

By WALTER K. ANGEVINE, M.D., *Washington*

PYRETHRUM AS AN effective means of killing insects pests has been used commercially for a number of years. The fact that the active principles, pyrethrin I and pyrethrin II (cycle ketonic alcohol pyrethrolone esters with chrysanthemum - monocarboxylic acid and chrysanthemum - dicarboxylic acid methyl ester) are harmless to warm-blooded animals, including man, but extremely toxic to cold-blooded forms of life, has made pyrethrum the most desirable, if not the most efficient component of nearly every household insecticide.

The medical literature on pyrethrum is meager. It is significant, however, that those who have investigated its use have found its action spectacular, both as an anthelmintic and in the treatment of scabies.

There is little reference in the literature and no clinical information as to the use of pyrethrum in the treatment of phthiriasis, or infestation of one or more species of lice on the human body These parasitic disease-spreaders are a bane to every army in the field, as may be recalled quite vividly by most World War veterans, and a problem to the medical staff of every large receiving institution for detention.

For a number of years the writer has been charged with medical administration in a large jail-type institution of the Federal Government. One of the factors vital to the high health standards maintained in these institutions is the establishment of a rigid sanative routine.

A recent survey of prisoners committed to jail in the District of Columbia reveals that nearly 7 per cent of those admitted suffer from one or more forms of parasitic infestation, and probably more than 2 per cent from scabies.

One of the orthodox treatments for these loathsome conditions is the application of mercurial, or blue ointment. Of course, this is a violent poison to man, and aside from its being unsafe for promiscuous use, its vermicidal action is slow and cumbersome. Large doses by inunction often cause inflammation to the hair follicles, and since there can be no question of the fact that mercury is absorbed, ptyalism may be caused just as certainly in that manner as by oral dosage.

These facts, together with the rather high percentage of cases, directed the writer's attention to the use of pyrethrum compounds. They augured the need of a more efficient preparation applicable to institutional use in particular, and compatible with medical therapeutics in general.

Through the cooperation of Dr. Alfred Weed and Messrs. Hoyer and Haude, associated with one of the larger pyrethrum manufacturers, the writer obtained for experimental work the jelly-like oleoresin of pyrethrum commonly produced when pyrethrum extracts are manufactured by the cold process. This jelly contains an extremely high percentage of organic waxes, fatty acids and resins, with an approximate total of 6 per cent pyrethrins.

To this substance petrolatum was added. It was noted that when the pyrethrum and petroleum jellies were mixed they exhibited a tendency to liquefy. On the theory that this was probably due to stearic changes, a special processing of the compound was necessary to restore its gelatinous character and to produce an unguent calculated to equal in toxicity a 20-pound pyrethrum concentrate. The finished product containing 2 per cent pyrethrins was called A-200 Compound.

This ointment is non-poisonous to man. It might be ingested without harmful reaction. In a series of tests large oral doses were administered to guinea pigs. No toxic effects were noted whatsoever. No changes were observed in the hemoglobin, urine and blood after large dosages, and the total of the pyrethrins fed to the pigs was recovered from the stools.

Following these experiments work was commenced upon those prisoners infested with vermin. It was observed that almost as soon as the A-200 Compound was applied the lice would curl and die within a few moments. Even when spread lightly over infested areas the tiny parasites which had burrowed into the skin would back out from their retreats and might be seen to convulse with paralysis. Since pyrethrum is a central nervous toxin to cold-blooded animals, death is preceded by paroxysms familiar to all who have watched its action. The eggs, which are usually extremely tenacious, immediately become detached from the hairs. On the whole, the action is almost instantaneous and very decisive. A very important fact is that in more than two hundred cases, a single application has been sufficient to delouse the patient, and there is not one instance of contact dermatitis or skin irritation to report by the use of this compound.

This complete success in the treatment of phthiriasis with A-200 Compound suggested its use as a specific for scabies.

Sweitzer and Tedder (1935) and later Sweitzer alone (1936) conducted a series of experiments with a 0.75 per cent pyrethrinated ointment in the treatment of this disease. Their reports stress the importance of preliminary scrubbing and bathing, and declare that success or failure of the treatment depends upon the thoroughness of this operation.

Their reports show further that with an ointment containing 0.75 per cent pyrethrins, contact dermatitis developed in 1 case. In 3 cases of skin irritation patch tests were negative.

A total of 1,213 cases of scabies were treated by these investigators, 878 requiring from five to seven days and 283 from seven to fourteen days to complete the treatment. In 52 cases they found it necessary to use Wilkinson's (sulfur) Ointment, either on account of pustular involvement or poor cooperation. The pustular cases were not recommended by them for treatment with pyrethrum ointment.

In more than 70 cases of scabies treated by the writer with A-200 Compound, it has been determined that scrubbing and bathing are not essential to successful treatment, with no contra-indications in pustular conditions as reported by the method of Sweitzer and Tedder. The most severe cases required no more than 3 applications of A-200 Compound, and in most instances lesions

were found to heal after a single treatment. No recurrences have been noted, nor has there been a single case of dermatitis or skin irritation, notwithstanding the pustular conditions to which the ointment was applied. The fact that the lesions healed so rapidly offers conclusive evidence that the mites had been completely destroyed, thus removing the source of irritation. This rapid action might be explained by the greater concentrations of pyrethrins in A-200 Compound, together with their more thorough dispersions in the base as formulated.

The excellent results achieved in these experiments might indicate that pyrethrum is deserving of further recognition in medicine, and a more thorough exploration of its possibilities would seem to be in order.

Reprinted from Medical Annals of the District of Columbia, Vol. X, No. 1, January, 1941.

Quotation for the Month

The only liberty that is valuable, is a liberty connected with order; that not only exists with order and virtue, but which cannot exist at all without them. It inheres in good and steady government as in its substance and vital principle.

—Edmund Burke.

Builds a Better Moth Trap That Kills Them with Kindness

Inventor Lures Them In With Food They Can't Digest

The familiar clothes moth is overly susceptible to indigestion, Harry T. Peirson, Brooklyn inventor, discovered.

"So all I did was build a moth trap that feeds them the food they like most and the larvae die of indigestion," he said.

"It is not only a better trap," he added with justifiable pride, "but it is the only one that doesn't scatter them around the house with a lot of smells they don't like. It lures 'em."

So Mr. Peirson started marketing his idea under the name of "Lur-em," and things are starting to hum.

The food that drags the moths willingly from the choicest of summer flannels is Mr. Peirson's trade secret. It is dusted into a piece of loosely woven wool which is used as the lining for a cardboard folder resembling a large packet of paper matches. A very small amount of poison is added to the food to speed up the devastating indigestion.

Took Dozen Years

It took a dozen years for Mr. Peirson to develop the appetizing moth lure and in his studies he accumulated a vast amount of moth lure, and learned a clothes moth will not be killed by a vapor if he can, within a couple of days, escape from it through a crack in the closet.

"And who have airtight closets in their homes?" he asked.

"I decided the only way was to invite the moths in—lure them as you do flies and mice. It's the only way to catch anything in this world."

The "Lur-em" trap was the result. After about a month in the moth-infested closet the trap is thrown away. By then the nests and dead larvae, turned from transparent to brown by the food, are visible in the wool.

Mr. Peirson's interest in moth traps developed when he decided on a cooling swim one summer Sunday, found his bathing suit ruined and had to suffer through the heat.

Larvae Worth 3 Cents

The start was learning to cultivate live larvae to discover their food likes. He was able, in time, to cultivate them with 100 per cent success despite a natural mortality rate of 95 per cent. The live larvae, incidentally, are valued at three cents apiece by research laboratories.

This successful cultivation proved he had the food they liked. After further experimentation with different wools the trap was born.

Mr. Peirson originally intended to dispose of the discovery. But a prospective backer, testing the trap's market value, brought back orders for 26 gross, and Mr. Peirson had to fill them.

—*New York World Telegram.*

Five of the dreaded Japanese beetles have been found in Florida.

—*Science News Letter.*

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APEX has proved its superiority on ship jobs and will do so on yours.

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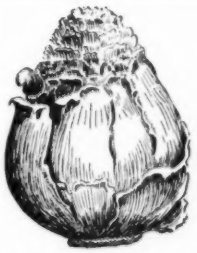

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An Effective Ground Squirrel Trap

By E. M. BECKER, *Deputy County Commissioner, Los Angeles County*

Recent experimental use of the well-known wooden box-type gopher trap rigged up with a baited trigger shows that it may have decided advantages in ground squirrel eradication work. The trigger is altered to spring the trap when pulled forward instead of pushed back as for trapping gophers. Half the trigger loop is removed and the bait is placed on the lower portion of the resultant hook, which is straightened to a horizontal position. The trigger is shortened so that the bait is held above the ground level. The back of the trap is replaced by a half inch wide strap iron stapled to the two sides equidistant between top of trap and ground level. This lights up the interior of the box compartment and allows the bait to be observed from both ends, but prevents the animal from entering the trap except from the front.

We believe this trap has some advantages over the spring steel trap previously used; it is more selective in its catch; it kills the animal almost instantly; it need not be looked at each day to prevent escape or suffering of maimed animals; it may be baited, making it more attractive; it can be properly set by inexperienced workers; it probably does not develop trap-wise squirrels, which escape from steel traps.

So far, we have found preferred baits to be whole walnuts, citrus fruits, and melon rinds.

Traps are only used where other methods have failed or where special conditions make other methods undesirable. In Los Angeles County they are an important part of our equipment in residential areas.

We recently set twelve traps around a yard where two families of ground squirrels were living. Eleven were caught the first day. Some of the traps were set within three or four feet of each other, yet squirrels were caught, even though trapped dead squirrels were in plain view nearby. Two old females were caught, one on the second, the other on the fourth day. Twenty-three squirrels were caught in a four-day period and later inspections revealed no sign of live squirrels.

Summary

During the past three years (1936-37-38) 18,384 ground squirrels have been trapped in Los Angeles County. This work was done in conjunction with our poisoning and gassing operations where these methods had failed to exterminate the squirrels. The trappers' reports give the following information:

1. More female squirrels were caught than male, 8,629 to 9,755.

2. No pregnant females were caught during the period August 1 to December 1.

3. 512 female squirrels carrying embryos were examined. The average number of embryos per female squirrel was 8.4.

4. The number of embryos per female squirrel increased as the squirrel population was diminished —1936, average 7.1; 1938, average 8.9.

5. 182 pregnant female squirrels were taken in April and 102 in May. These were the two high months of the year.

6. The No. 1 Jump trap and the No. 1 Newhouse trap were the most reliable traps used in this work.

Note: A rebuilt box gopher trap, which was baited, proved highly efficient. This trap is selective in its catch and kills the squirrels when caught.

7. Covered sets were usually used with the steel traps.

8. Trapping with steel traps is a less selective method than poisoning or gassing.

9. Animals other than squirrels caught listed in the order of the number taken: rabbits, rats, skunks, birds, gophers, snakes.

10. Trapping is a slow and expensive method of squirrel control and is only justified in eradication work or where all other methods have failed.

Reprinted from Bulletin, Dept. of Agriculture, State of California, Vol. XXIX No. 3.

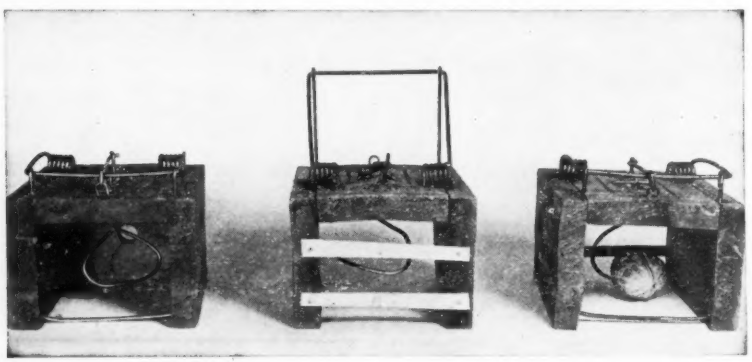

Fig. 1. Left: Standard box trap for pocket gophers. Center: Modified box trap for ground squirrels, with trigger reversed and rear wall replaced with metal strips to allow view of bait. Right: Same trap baited and set.

Office Management

1. Are all inquiries for service, estimates given, and inspections made, recorded in the office for future reference?

2. Do you completely record orders and work as it is completed, or is it allowed to pile up?

3. Is your office organized to handle "preferred attention" items without disturbing the normal flow of work?

4. Have you ever studied all forms in use in your office, to check for duplication, reference value, sequence of information, and posting procedure?

5. Are all reports produced in your office actually used?

6. Are your accounting records maintained in such a manner that statistics are available quickly, and without separate analysis?

7. Are office employees obliged to find their work in different places, or does the work flow to each desk in orderly process?

8. Do you systematically check your office routine in order to avoid unnecessary overhead expenses?

9. Are your office employees cordial, friendly, and courteous at all times?

An Antartic Island Run by Hungry Rats

South Georgia, a tiny island situated in the lower regions of the South Atlantic Ocean, is doomed because it is infested with probably more rats per square mile than any other place on earth.

A peculiar fact is that these rodents are of the brown species, which are native to Asia which is away over on the opposite side of the globe. The rat ridden island borders on the antarctic and is covered with the everlasting ice and snow of latitude 55 degrees. But this frigid condition, however, does not seem to hold back the speedy propagation of countless devastating invaders which are responsible for the island's inevitable fate, for they have thrived mightily in a comparatively short time.

The Orient is the original habitat of all rats and from its crowded shores the pests have emigrated to every corner of the earth on ships and by land. There is no record of a rodent scourge in Europe prior to 1030 A. D., at which time a fleet of Asiatic trading vessels visited several French ports. In addition to the cargo, these boats carried the first stowaways, the forerunners of a pestilence to come—the black rats of India. These rodents multiplied rapidly and for several hundred years dominated the whole of Europe.

During the thirteenth century a brown variety made its appearance, crossing from the Orient to Russia and thence into Europe proper. The newcomers were much larger and more viciously aggressive than their predecessors, so they made short work of the black rats. From Europe the brown travelers invaded the New World via the wooden ships of the early colonists.

And in this wise the scourge finally reached the little British whaling station of South Georgia. The rodent stowaways were at once attracted shoreward by the abundant food supply of whale carcasses left strewn about the beach by whalers after the sperm oil, blubber, and other valuable ingredients have been removed to sell.

A visit to this frozen beach gives anyone the "creeps," for the feeding ground is literally alive with thousands of hungry rats, milling, fighting, squealing as they gobble the cast-off meat. They appear to be harmless so long as their food supply is continually replenished by the whalers. But whales are becoming scarce and the foraging rodents may soon drive every other living thing from the island.

"Better alone than in bad company."

Lethal Posies

Country cousin to the giant "mums" that adorn football fans is the new pyrethrum chrysanthemum, perfected by Dr. Brooks D. Drain, University of Tennessee Experimental horticulturist, Knoxville, after nine years. From this modest blossom is extracted pyrethrin, deadly as an insecticide, but practically harmless to human beings.

Pyrethrin is the death dealer in a half dozen major household and field insecticides which are widely advertised. Three quarters of a million tons of the chemical have been imported into the United States annually — from the Mediterranean, then from Japan, and lately from South Africa.

Dr. Drain claims to have developed the pyrethrum 'mum until its insecticide strength is twice that of the Japanese variety and half again as powerful as the South African kind. He has adapted it to East Tennessee until an average production of pyrethrum blossoms weighs 1,000 pounds to the acre.

—*Business Week.*

As the Mothball Season Opens

Than **this** there is little we'd like any more,
And little for which we're as keen:
That Guy in Berlin put in permanent storage in paradichlorobenzene!*

—Al Graham.

**A colorless crystalline compound used for the destruction of grubs, borers, etc.—Webster's New International Dictionary.*

N. Y. Times—April 27, 1941

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A homogenous blending of two valuable insecticides. The two ingredients reinforce each other and form an effective pest controlling combination.

This insecticide is milled into a clean, fine powder that passes easily through the usual powder blowers and dusters.

It is practically odorless, non-inflammable and eminently suitable for use in dwellings, hotels, restaurants, schools, institutions, ships, etc.

To control and exterminate household pests when they are once established on the premises requires persistent efforts over a period of time.

The modest price at which this insecticide is sold will enable the purchaser to use it freely and obtain prompt results.

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10 lbs. @ 25c per lb.
25 lbs. @ 22c " "
100 lbs. @ 20c " "
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Some Interesting Pest Control Case Histories

Excerpted from Connecticut Agricultural Experiment Station, Thirty-Ninth Report, Connecticut State Entomologist R. B. Friend, PH.D. State Entomologist Bulletin 434.

The Crazy Ant in Connecticut. In March, 1939, specimens of Paratrechina longicornis Latr. (determined by M. R. Smith) were collected in a New Haven hotel. These ants were found in many parts of the building and were causing much loss by infesting food and some annoyance by appearing in large numbers in guest rooms. They were apparently nesting in cracks behind the woodwork and were controlled by systematic use of poisoned baits.

According to Marlatt, the crazy ant is a tropical species which has been found in large buildings in various parts of the country. In the New Haven building it had been seen for at least a year prior to identification.—Neely Turner.

Dermestid Larvae in Composition Board. Specimens of a *Dermestes* larva were received in July from a summer cottage near Hartford. These larvae had bored into the composition board used instead of plaster. Eight or ten holes had been made, and larvae were also found underneath a braided rug. The owner was advised that these larvae had developed on some decaying animal matter, and that they had a habit of boring in soft wood to pupate. It was suggested that a possible source of the trouble was a dead animay underneath the cottage, which had no cellar. Within a few days the owner sent the following information: "Following a suggestion in your letter and also because most of the larvae seemed to be near the firepace, I poked around the chimney with long-handled brushes. Finally I dislodged a hard object from a narrow shelf just back of the damper, which probably was a squirrel. It must have fallen down, suffocated, and then baked hard by the fire, so that we did not realize it was there. Very likely these pests will soon disappear."—Neely Turner.

The House Cricket, *Gryllus domesticus* Linn. A telephone call was received from Dr. Shay of the Health Department, Bridgeport, Conn., requesting information about crickets infesting a home on Birmingham Street in the north end of the city. The home was visited with Dr. Shay and one of his assistants and was found infested from attic to cellar with the house cricket, *Gryllus domesticus* Linn. It was a new house, built less than a year, and was located within a city block of a dump. Soil covered the debris in the dump which was maintained in such a manner as to leave only the latest material temporarily uncovered.

The crickets had been in the house for about two weeks. They had eaten large holes in three dresses, ruining them. More than a hundred had been killed by a fly swatter were observed. On August 12, a letter was received from a resident of Thorne Street, which is also in the vicinity of the same dump. The writer stated that the neighbors as well as his own family were suffering from an outbreak of crickets in their homes.

It was recommended that a poisoned bran bait be used in each case. The formula follows:

Wheat bran	5 pounds
White arsenic or Paris Green	4 ounces
Cheap molasses	1 pint
Water	7 pints
Lemons	1

The bran bait should be scattered thinly around the places where the crickets are found and outdoors around the home. Domestic animals or birds should not be exposed to any quantity of the bait. If the bait is scattered very thinly, little danger exists for animals or birds.

The house cricket was first reported in Connecticut from Shelton in 1918 and only four reports precede the present one in our records. Probably this small outbreak originated in the dump.—J. Peter Johnson.

Clover Mite in Dwellings. Each summer we receive complaints about clover mites (*Bryobia praetiosa* Koch) entering homes. These pests are of no great economic importance, but when they enter homes in large numbers they become a nuisance to the housewife. They are so small that they can easily gain entrance through screens and under doors and windows.

Most of the recommended methods of control have failed when the mites are present in large numbers. At one house in Branford, where these pests have been troublesome for several summers, the householder applied tree tanglefoot under the lowest course of clapboards all around the house to prevent the mites from crawling up higher and getting in through the screens. This stopped the mites from entering until the tanglefoot had become hardened or bridged over by the bodies of mites. As long as the householder kept the tanglefoot fresh and sticky there was no trouble, but this meant almost daily attention.

As most of the mites were on the south and west sides, the lawn on these sides was covered with a fine sulfur dust for about 15 feet from the house. Shortly after the sulfur dust application it rained for nearly two days following which mites seemed to be as abundant as before. Another light coating of dust was applied on a warm sunny day. Several hot days followed immediately after the application. The householder reported about two weeks later that the mites were apparently all gone and there was no further trouble with this pest the rest of the summer.—M. P. Zappe.

Total War

The ants when forth to war they went,
Were moved by noblest ends, and stole
The beetle's land with kind intent,
And slew the worm to save his soul,
While thus they raised their battle song:
"We do the right by doing wrong!"

They drained all honey from the bee,
And clipped the moth for his own good.
With slashing jaws, they claimed a fee
For breathing in their captured wood.
And still they sang, a conquering throng,
"We do the right by doing wrong!"

They swarmed and looted, bored and stung;
Torn wings and bone-heaps marked their story.
"We'll regulate the world," they sung,
"And chain it for great Antdom's glory!
God's chosen insects must be strong—
We do the right by doing wrong!"

—Stanton A. Coblentz.
—New York Times.

Public Relations —Fumigation Service

(Continued from Page 7)

14. Each crew be outfitted with a safety kit containing the following:

(a) A diagram showing the Schafer Prone Method of resuscitation.
(b) Smelling salts (Ammonium carbonate).
(c) Amyl Nitrite, 5 minims.
(d) Gauze bandage, Band-Aid adhesive tape and antiseptic.
(e) Turkish towel.
(f) New canister.
(g) Permit if such is required.
(h) Aromatic Spirits of Ammonia (well stoppered and in a dark bottle).

15. No fumigation project be carried out unless the operators be familiar with the Schafer Prone Method, especially on Cyanide fumigations.

16. No persons will be permitted to enter the fumigated premises before the fumigator has satisfied himself by personal inspection without gas mask that it is safe for occupancy.

Flour Mill Pest Control Expenditures

A survey shows, according to **April, 1941, American Miller,** that millers spend about $1.00 per year—per bbl. of daily milling capacity for fumigants, insecticides and other insect control supplies. In other words a mill with a capacity of 1,000 bbl. daily spends $1,000 per year. Total flour milling capacity in the United States and Canada is approximately 1,000,000 bbl. daily, hence there is a $1,000,000 yearly sales potential in flour mills alone, plus about a third or a half again as much in rye, rice, corn, cereal and specialty mills.

A case history of purchase in a 100 bbl. daily capacity flour mill discloses an interesting fact concerning amount of money annually spent for fumigation compared with other mill expenditures. The smallest yearly cash outlay for repairs and supplies in this mill was $780.34. Even in this year of smallest expenditure more than 10 per cent of this total or $90.33 to be exact, was spent for fumigating material. During the same year $54.22 was the belting cost; bolting cloth cost $85; floor and hand brushes, $22.50; stationery and printing, $98.50, etc.

Since this case history was obtained Federal seizures of infested flour have mounted so rapidly that most mills have greatly enlarged their spending for insecticides and fumigations. Flour seizures have increased in the last two years to an alarming extent.

The Japanese beetle has spread to 23 states. —*Science News Letter.*

The Pest Thysnurans of New England

(Continued from page 9)

The nymphs mature in two to four months under optimum conditions, but approximately a year is required at 80°. As with the silverfish growth and molting continue throughout life. The average length of life is approximately two years, although occasional individuals may live much longer.

The life history of Ctenolepisma quadriseriata is not as well understood as that of the silverfish and firebrat. Its development appears to resemble that of the firebrat rather closely.

Feeding Animals Sulphur Does Not Control Lice and Other Pests

O. G. Babcock, Sonora, Tex., laboratory of the Bureau of Entomology and Plant Quarantine, reports that feeding a maximum of Sulphur to goats and cattle over a period of 10 months failed to retard the development of biting and sucking lice, spinose ear tick, horn fly, and stable-fly. Some animals were kept in dark stalls for three months, then exposed to the sunlight for the remainder of the test others were kept in pens in the open. —*C. P. Institute.*

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Tomorrow's Policy Will Not Cover Today's Accident

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Fumigation – Pest Control

Problems in Buildings Old or New

By THOMAS M. McGRATH, *Chief Fumigation Inspector, Newark, N. J., Department of Health*

EDITOR'S NOTE: *The Department of Health of Newark, N. J., issues a voluminous report annually of its activities. Of particular interest is that section which has to do with our industry. Following is a verbatim copy of the report written by Chief Inspector Thomas M. McGrath. There is likewise included after Mr. McGrath's report additional recent legislation that concerns itself with the use, sale and distribution of exterminators and insecticides.*

The supervision of dangerous gas fumigations and pest control procedures which started in 1938, greatly increased in 1939. All fumigations with the exception of rummage sale fumigations are carried out by fumigating companies licensed by this department. Rummage sale fumigations are performed by department inspectors.

In 1938, the five licensed fumigating companies performed 31 fumigations. In 1939, nine companies operated and performed 289 fumigations. The gases employed were Hydrocyanic Acid, Chloropicrin and Ethylene Oxide-Carbon Dioxide.

The inspectors assigned to fumigation supervision are trained and hold National Red Cross Certificates for first aid. The equipment they carry and use, consists of gas masks, warning signs, permits, safety locks, gas detector and antidotes.

Rodent and Insect Control

Because of the failure to make repairs to many structures and the increase in the number of demolitions in the city, rat complaints have greatly increased. The rat nuisance is not confined to any particular section of the city but is widespread. Since March, 1939, the department has engaged in a definite and progressive campaign to eliminate these dangerous pests.

Through the cooperation of the Building Department all structures intended for demolition are inspected for rodents by health department inspectors. When buildings are found infested, the wrecking companies employ licensed pest control operators to fumigate. The Newark Housing Authority has caused the demolition sites at South and Pacific and Orange and Nesbitt Streets to be gassed under the supervision of the department of health. The majority of the slum structures were badly infested with rats and vermin.

Complaints of insect invasions of dwellings, factories, food and beverage plants, etc., are investigated, insects identified and proper control measures advised, with emphasis placed upon the employment of competent pest control operators. Householders are warned against the indiscriminate use of poisons for extermination purposes.

Total Number of Fumigations	402
Demolition Structures Inspected (Rats) 272 — Fumigated	190
Occupied Dwellings Fumigated (Insects)	41
Factories, Breweries, Food Plants Fumigated (Insects)	14
Food Trucks Fumigated (Insects)	15
Warehouse Chamber Fumigations (1053 Mattresses)	23
Rummage Sale Fumigations	113
Rodent and Vermin Complaints	136
Persons Bitten by Rats	11

An Ordinance to Control the Use, Sale and Distribution of Exterminators and Insecticides

Adopted by the City Commission, March 20, 1940

1. No person shall sell or give away or distribute in the City of Newark, any poisonous substance as an exterminator or insecticide unless the container bears a label legibly and conspicuously printed with the word "POISON" and the symbol of the skull and crossbones in red ink followed with the words "CAUTION"—This exterminator or insecticide contains (State name of the poison), a deadly poison, together with the antidote therefor and the name and address of the manufacturer or packer, and the words, "POISON," "CAUTION," "ANTIDOTE" in block type of a larger size than the other wording, viz:

POISON
SYMBOL
(SKULL & CROSSBONES)

This exterminator or insecticide contains
(insert name of poison)
A deadly poison.

Antidote—State Briefly

Manufactured (or packed) by
Name.....
Address.....

2. The term "exterminator" or "insecticide" as used herein shall mean and include any substance, not a fumigant, under whatever name known, used for the destruction or control of insects, vermin, rodents or other pests.

3. No person shall sell, offer for sale or give away any fluoride to be used as an exterminator or insecticide, unless said fluoride is dictinctly colored Nile blue. No fluoride, other than fluoride distinctly colored Nile blue shall be used as an exterminiator or insecticide by anyone other than persons engaged in the business of extermination.

4. No person shall prepare or manufacture, sell, offer for sale, give away, deal in, supply or use, or have in his or her possession, with intent to sell, offer for sale, give away, deal in, supply, or use an extermin-

Quick-Road . .

Manufacturers and Supply Houses of pest control chemicals, equipment, etc., who advertise in PESTS, and their control, find it the quick-road to contact America's top-flight PCOs—the high-road to increased sales. This is the right time to sell your story.

This size space cost slightly in excess of 1c per month per reader

Forms for July issue close June 25th

WIRE, AIR-MAIL OR WRITE

PESTS AND THEIR CONTROL
512 E. 14th Street
KANSAS CITY, MO.

ator or insecticide which contains living bacterial organisms or any culture or preparation thereof.

5. Any person, persons, firm, partnership or corporation violating the provisions of this ordinance shall upon conviction thereof, be liable to a penalty of not more than twenty-five ($25.00) dollars or not more than ten days in jail, for each and every offense.

6. All ordinances and parts of ordinances inconsistent with the provisions of this ordinance be and the same are hereby repealed.

7. This ordinance shall take effect immediately upon final passage and publication according to law.

Old Headache Remedy Becomes An Insecticide

Washington.—A derivative of a drug that relieves headaches and quenches fever is the basis of a new insecticide developed by a United States Department of Agriculture research worker. This is described in a patent (No. 2,239,832) awarded to Lloyd E. Smith of Washington, D. C.

The new product is an amino derivative of acetanilide, which is used in medicine as an antipyretic and anodyne. Aminoacetanilide, the inventor states, unlike lead arsenate, which it is designed to replace as an insecticide, is non-toxic to human being and warm-blooded animals.

Barring mishaps, a termite may live five years. —*Science News Letter.*

Rat and Mice Lore

South African warriors believe that if they twist tufts of a rat's hair among their own curly black locks they will have just as many chances of avoiding the enemy's spear as the nimble rat has of avoiding things thrown at it; hence in these regions rats' hair is in great demand when war is expected.

In many parts of the world it is customary to put extracted teeth in some place where they will be found by a mouse or rat, in the hope that, through sympathy which continues to subsist between them and their former owner, his other teeth may acquire the same firmness and excellence as the teeth of these rodents. At Raratonga, in the Pacific, when a child's tooth was extracted, the following prayer used to be recited:

"Big rat! Little rat!
Here is my old tooth,
Pray give me a new one."

Then the tooth was thrown on the thatch of the house, because rats make their nests in the decayed thatch. The reason assigned for invoking the rats on these occasions was that rat's teeth were the strongest known to the natives.

An ancient Greek treatise on farming advises the husbandman who would rid his lands of mice to act thus: "Take a sheet of paper and write on it as follows: "I adjure you, ye mice here present, that ye neither injure me nor suffer another mouse to do so. I give you yonder field (here you specify the field); but if ever I catch you here again, by the Mother of the Gods, I rend you in seven pieces.' Write this, and stick the paper on an unhewn stone in the field before sunrise, taking care to keep the written side up." In the Ardennes they say that to get rid of rats you should repeat the following words: "Male rats and female rats, I conjure you, by the great God, to go out of my house, out of all my habitations, and to betake yourselves to such and such a place, there to end your days." Then write the same words on pieces of paper, fold them up, and place one of them under the door by which the rats are to go forth, and the other on the road which they are to take. This exorcism should be performed at sunrise. Some years ago an American farmer was reported to have written a civil letter to the rats, telling them that his crops were short, that he could not afford to keep them through the winter, that he had been very kind to them, and that for their own good he thought they had better leave him and go to some of his neighbors who had more grain. This document he pinned to a post in his barn for the rats to read.

Sometimes the desired object is supposed to be attained by treating with high distinction one or two chosen individuals of the obnoxious species, while the rest are pursued with relentless vigor. In the East Indian Island of Bali, the mice which ravage the rice fields are caught in great numbers, and burned in the same way that corpses are burned. But two of the captured mice are allowed to live, and receive a little packet of white linen. Then the people bow down before them, as before Gods, and let them go.

The Golden Bough,
Sir James George Frazier,
F. R. S., F. B. A.

A PREPARED RAT BAIT

19½c PER POUND IN ONE POUND TIN CANS
NO FUSS - NO MUSS - NO MIXING
USE

HAN-DEE* RAT KILLER

HAN-DEE Rat Killer is a scientifically prepared rat bait, which is mixed ready for use, you simply open the can and place the baits with a spoon. The toxicant is oven dried red squill, which has been biologically tested.

HAN-DEE is packed in MEAT, FISH and CANTALOUPE baits to afford you a variety of baits, for your convenience HAN-DEE is packed in one pound sealed tin cans—no stale bait to be used next day with HAN-DEE, always ready for use when you need bait.

HAN-DEE may be used with safety in restaurants and packing houses where poisonous materials are prohibited.

Packed in cases of three dozen, one pound cans, either in one kind of bait, or any assortment of the three baits.

Write For Descriptive Literature

	Per Doz.
THREE DOZEN (1 CASE) LABELED	$2.50
GROSS LOTS, LABELED	2.40
GROSS LOTS, NO LABELS	2.35

Freight prepaid on gross lots to all points east of Rocky Mountains.

*Formerly SUR-RID

SUR-RID PRODUCTS COMPANY
455 PAUL BROWN BUILDING, ST. LOUIS, MISSOURI

P.C.I. Fumigation Standards Make Safety First a Must — Thoughtful Fumigators Everywhere Are Equipping Their Service Staffs With Acme Full Vision Gas Masks* . . .

And here's why:

1—FULL VISION, an exclusive ACME feature, affords the wearer unobstructed vision . . . thereby making for greater safety and efficiency . . . Thus minimizing possibility of accidents, reducing their ratio and the extent to which they do they bring about lower insurance costs.

2—They help contribute to your peace of mind.

Play safe . . . Write for Folder M387 on Acme Canister Masks

Acme Protection Equipment Co., Inc.
Manufacturers of Respiratory Protective Devices
3605 Liberty Ave. Pittsburgh, Pa.

*Equipped with Acme Type HCN Canisters

LOCAL ORGANIZATION NEWS

Connecticut Pest Control Association

The Connecticut Pest Control Association held its final meeting of the season April 22nd at 2:30 at the Connecticut Experimental Station in New Haven. Those attending were as follows: Messrs. Turner, Dietz, Bohman, B. Powell, Mason, Heap. Duncan and Anderson. It was brought out by the Secretary's report that all members of 1940 had paid membership dues for 1941. After conclusion of the business meeting, the members had the pleasure of listening to Mr. Vincent-Daviss of the Du-Pont Co. who gave a very interesting and educational talk on "Cyanegg" fumigation. The meeting adjourned at 6 P. M.

Antimite Representatives Hold Meeting

Antimite representatives from the Eastern territory gathered together at the McAlpin Hotel, New York, on April 25-26 for their sectional meeting. The meeting was conducted by Arthur Ochs, St. Louis representative for the Antimite Company, and Val Glueck, Washington, D. C., also a company representative.

Among those in attendance were: F. W. Brown, Waltham Chemical Co., Waltham Mass.; W. O. Buettner, Oscar G. Buettner & Son, Inc., Brooklyn, N. Y.; Alfred E. Bungay, Oscar G. Buettner & Son, Inc., Brooklyn, N. Y.; Vincent T. Burr, Rose Exterminator Co., New York, N. Y.; George Daudert, Theodore Meyer Est., Philadelphia, Pa.; Ray Frederick, Antimite Engineering Company, Washington, D. C.; Leonard Y. Goldman, New England Pest Control Co., Providence, R. I.; F. K. Harder, Harder Extermination Service, Inc., Hempstead, N. Y.; Joseph C. Kopf, Theodore Meyer Est., Philadelphia, Pa.; J. W. Linn, Harder Extermination Service, Inc., Hempstead, N. Y.; Martin T. Meyer, Theodore Meyer Est., Philadelphia, Pa.; Hugh Meadows, Washington, D. C.; W. J. Shrimplin, Rose Exterminator Company, New York, N. Y.; Lester M. West, Rose Exterminator Company, Boston, Mass.

The entire first day of the conference was devoted to the various questions concerning the ANTIMITE SYSTEM OF TERMITE CONTROL, while the second day was taken up by a tour of inspections covering some of Mr. Harder's work.

There is no question as to the value of such symposium and exchange of experiences. It is understood that the company is planning on similar meetings in the different sections of the country. These conferences should make for "National Unity" among The Antimite Company's exclusive representatives.

Entomological Literature

FURTHER NEW SPECIES OF TICKS (ORNITHODOROS) FROM BATS (ACARINA: ARGASIDAE)

Complete paper covering description, etc. by R. A. Cooley, Entomologist, and Glen M. Kohls, Assistant Entomologist, U. S. Public Health Service appears in April 25, 1941 issue Public Health Reports, Vol. 56, Number 17. For sale by Superintendent of Documents, Washington, D. C.—Price 5c. (no stamps).

Publications, Books, etc: The following are called to the attention of our members:

(A) **"Insect Pests of Stored Grain and Grain Products"** by Dr. Richard T. Cotton. The enclosed descriptive folder gives the essential information. Regardless of your being interested in fumigations of insect pests of stored grain and grain products, every fumigator should have a copy of this book in that there is valuable general information. Send $3.00 directly to the Burgess Publishing Company, 426 South Sixth Street, Minneapolis, Minn.

(B) **"Insect Pests"** by William C. Harvey and Harry Hill. This is an English Text published 1940 by the H. K. Lewis & Company of London. Owing to war conditions, it is difficult to assure immediate delivery and through G. H. Stechert & Company, 31 East 10th Street, New York City, distributors, the approximate cost is $2.52 subject to slight changes and possibly four months before delivery can be made. We would suggest that orders be placed now if interested and send check in the amount of $2.52.

(C) The following may be purchased by sending $.05 each in cash to the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

1. "Regulations for sale of viruses, serums, toxins, and analogus products, in D. of C. and in interstate traffic." (Public Health Service, Miscellaneous Publication 10).
2. "The House Rat." 1941. (Fish and Wildlife Service, Wildlife Circular No. 6.)

Insect Pests—An English Text

As Reviewed by J. J. DAVIS

There has just come to our attention a book, published in 1940, which should be of special interest to commercial pest control operators. It bears the title "Insect Pests" by the English authors William Clunie Harvey and Harry Hill. We quote from the first chapter, as follows: "The extermination of vermin is no longer governed by haphazard, rule-of-thumb regulations, but is a skilled procedure requiring the employment of scientific methods and of persons possessing considerable technical knowledge. It is only within recent years that the methods originally in use have been abandoned, following the pooling of ideas from different authorities. As might be imagined, this has resulted in benefit to the community. . . . The degree of ill-health and suffering resulting from verminous conditions, particularly in the home, cannot readily be estimated, but it is quite sufficient to have caused the more enlightened authorities to make strenuous efforts to rid their districts of vermin of all kind.

"The invasion of property by a variety of insect pests has created a problem which is engaging the attention of public health, medical and commercial authorities throughout this country (Great Britian), as well as abroad. The bedbug, the flea and the louse are the more familiar enemies of mankind, and medical literature abounds in details of the toll of suffering and disease caused by these pests. To counteract the activities of such insects a knowledge of their habits and mode of life is essential. For this, we have to thank the scientific entomologist, whose work in field and laboratory has considerably simplified the task of destruction. A lack of such knowledge on the part of operators leads to misdirected effort and to the wastage of valuable material.

"While the knowledge of the habits of insects provided by the entomologist is of considerable importance, it would be of little value without the co-operation of the chemist, who provides the lethal weapons necessary for destruction. Chemists are constantly experimenting with a view to producing new and more effective remedies. While many extravagant claims are made for a large proportion of these remedies, it is essential that they should be maintained in proper prospective until the validity of such claims can be fully substantiated.

* * * * * * * * *

"While there is an abundance, indeed a superabundance of suitable chemicals available for the destruction of verminous insects, a dearth of skilled operators still exists, due probably to the lack of thought given to the work. The foundation of successful vermin destruction is an accurate knowledge of the habits, life history and environment of the insect in question, and it is only when this problem has been properly tackled and thoroughly understood, that the chemical and mechanical means of combating the pests can be utilized.

"For these reasons, it is essential that persons in charge of disinfestation work should possess a sound knowledge of the following subjects:

"(1) Elementary entomology.

"(2) Materials used and the reasons therefor.

"(3) The need for the application of certain materials in certain specified ways.

"Until recently, and, indeed, even at the present time, the work of disinfestation was being carried out by inexperienced operators, using ineffective methods and supervised by individuals with the barest knowledge of the principles of disinfestation. This is particularly unfortunate, since the ability of the operator is of the very greatest importance. In addition to skilled workmen, satisfactory materials are also essential. Thus, the ultimate goal of pest extermination is the elimination of untrained men and the weeding out of poor materials, for too many of which are still in use. It cannot be too often emphasized that there are no short cuts to vermin extermination; neither are there any sterotyped methods of treatment, each case of infestation requiring attention as its own particular merits."

We have quoted a considerable part of the introductory chapter of this English

book, because the comments so well apply to conditions in America.

The following pests are discussed in more or less detail, including control recommendations: the bedbug, flea, louse, cockroach, cricket, silverfish, ants, itch mite, psocids or book lice, earwig, wood lice or sowbugs, and house fly.

Nearly two hundred pages follow with a discussion of the principles and practice of disinfestation, including the kinds and technique of fumigation, liquid and dust insecticides. Space is also given to educational measures and legislative control, as well as chapters on human toxicology, and the disinfestation of foodstuffs and ships.

The commercial pest control operator can well afford to have this book on his bookshelf.

(For price and publisher's address, see column 1, page 28—paragraph B, under Entomological literature.)

June Meetings

State Realty Men Will Open Convention on June 26

Preparedness will be the theme of the annual convention of the Real Estate Association of the State of New York, to be held at the Sagamore, Bolton Landing, Lake George, N. Y., June 26 to 28, according to John Marbach, president of the association. Defense housing and taxation will be among the chief topics.

June 16-19. National Association of Building Owners and Managers, Chicago. W. J. McLaughlin, 134 S. La Salle St., Chicago.

WHAT'S NEW IN PEST CONTROL-PERSONALS

Greenpoint Chemical Co. have moved to new and larger quarters at 342 Flushing Avenue, Brooklyn, N. Y.

S. B. Penick & Co., formerly located at 132 Nassau Street, N. Y. C., have moved their executive offices to 50 Church Street where they occupy an entire floor.

The National Sanitary Supply Association elected Marshall L. Magee of T. F. Washburn Co., Chicago, as President, at the 19th Annual Convention held April 21, 22, 23, 1941, at the Hotel Jefferson, St. Louis, Mo. Next year's Convention was tentatively set for Philadelphia about the middle of April.

RESTAURANT CATCHES FIRE AFTER VISIT BY PCOs

While in Sacramento, California's capital, on legislative business, Bill Hogan, Dad Alderman, Wayne Davis, Scotty Gunn, Leo Godliner, Jess Miller and Bob Hackley were awakened at 7 A. M. by a fire in a restaurant opposite their hotel. Now a passing fire or even the loss of a few hours sleep on the part of PCOs is hardly news but this is what makes it a "man bites dog item"—the Committee was in that very same restaurant just five hours earlier partaking of waffles and it is Bill Hogan's theory—and only his—that Dad left a lit cigar butt around. Now whether or not this is so we wouldn't know since we weren't there, but all the others present believe Bill's accusation was motivated by jealousy of Dad whose venerable grey-white hair found "favor" with a particularly comely waitress in the aforesaid restaurant. Cherchez la femme! Ain't it always been so?

W. W. Angus, Inc. 239 Eleventh Avenue, N. Y. has been appointed representative in the New York Metropolitan area for McLaughlin, Gormley, King, & Co. of Minneapolis, Minn., on their line of products for the pest control industry.

It is interesting to note various indications of improved business activity. The Barrett Co., Exterminators, of 611½ East 10½ St., Houston, Texas, report that their business has grown to the point where it became necessary to move into larger quarters at the above address. Congratulations!

Darrell Clyde Miller, son of Mr. and Mrs. Jess M. Miller of the Miller Pest Control Company of Hollywood, Calif., was married on April 19th to Helene Elizabeth Knock. Congratulations.

Congratulations are also in order to Mr. and Mrs. Harry Lewis of the Rose Exterminator Co., of Buffalo, N. Y., whose daughter Dorothy, graduated from the Millard Fillmore School of Nursing. This also reminds us of the rather unique mailing card sent

"Positive" - "Safe" and "Sure"

USICO SILVERFISH CONCENTRATE

"FACTS"

KNOWN WORLD WIDE!

(1) It will exterminate all Silverfish in building completely and properly treated within 40 days: ONE TREATMENT will protect against reinfestation for THREE YEARS.

(2) Harmless to human beings and animals, simple to apply, no tearing up or marring woodwork, yet placed away from any chance of removal. No inconvenience to tenants whatever.

(3) One pound will treat completely—three 2-room apartments, two 3-room apartments, or a basement room 20x20.

(4) It has fulfilled every claim made for it, under the worst conditions known. Write for testimonials.

(5) "NEW LOW PRICES"—$1.00 per pound, f.o.b. Seattle, Washington. Minimum amount 10 pounds. Shipped express.

(6) *Don't envy the exterminator who can guarantee the above performance, be one!!!*

U. S. INSECTICIDES CO.

412 Hoge Building Seattle, Washington

Rat and Mice

Exterminating Liquid

Per-Mo Rat and Mice Exterminating Liquid can be used as a drink or can be mixed with any food and used as a bait.

Economical to use and a "Guaranteed" Rodent Exterminator.

If you wish an 8-oz. sample send 25c in stamps or coin to cover packing and postage.

"USE"

PER-MO MOTHPROOFING LIQUID FOR GUARANTEED SERVICE

Per-Mo Mothproofing Treatment will prevent moth and carpet beetle damage to Upholstered Furniture, Carpets, Rugs, and Clothing for FIVE YEARS and to Blankets that are laundered for a period of THREE YEARS.

Per-Mo Mothproof is a colorless and odorless liquid, that is applied to any woolen fabric with a spray-gun, either electrically or hand powered. Write for full particulars.

We Will Pack "Per-Mo" Under Your Private Label Write for Details

PER-MO MOTHPROOF CO.

3729 Virginia, Dept. M. Kansas City, Mo.

by Harry which shows a back view of himself and the caption under it reads, "I would like to meet you face to face."

And to complete the cycle of congrats, a fourth son and PCO in the making whose name is to be Donald James, was born to Mr. and Mrs. Arthur W. O'Connor of Brooklyn, N. Y. We all recall the splendid Ladies Program provided by Virginia O'Connor as chair lady of the Committee. Arthur is the president of the Security Exterminating Co. Oh, yes, another daughter to report. To Mr. and Mrs. Gerald Clem of the Rose Exterminating Co., of St. Louis, Mo., there arrived Nancy Lucille on May 13th.

New York City was graced with an array of PCOs lately and among the visitors were George R. Elliott, Cady Corl, Charles W. Houghton, Martin Meyer, Mr. and Mrs. V. H. Montgomery, F. E. Bohman. We hear that "Bill" Buettner took advantage of these visits to have chats about the industry and otherwise discuss plans of activities of the National Pest Control Association. Added to the list was also Prof. J. J. Davis. "Monty" and his wife all the way from San Francisco, Calif., took out enough time to discuss plans for the coming Ninth Annual Convention that is to be held in San Francisco, on October 27-28-29.

This also brings news of the progress report as to booth exhibitors that are already scheduled to participate at the Convention. Already reservations have been made by American Cyanamid & Chemical Co.; E. I. du Pont de Nemours; Hudson Sprayer Company; United States Rodent Destroyer Company; Associated Chemists, Inc.; and Sennewald Drug Company. Watch for the new slogan that Sennewald will soon be springing in that he cannot possibly use "Booth Ten for Senn" this year by virtue of having taken over Booth 18. Just a little pun on Senne's first name and the hotel at which the convention will be held will bring the slogan this year "Come and See Francis at the St. Francis."

The sincere sympathy of the Pest Control industry is expressed to the family of Joseph Billings of the Steamship Sanitation Company, Inc., of New York City, who on May 10th, was killed in an effort to save the life of an employee, who for some unknown reason, was suddenly found prone on the floor of the hold of a vessel which was being fumigated. The company will continue under the direction of Mrs. Joseph Billings.

BILL BUETTNER: When last heard from Bill hadn't been to bed for 48 hours. Cause: a ship fumigation as well as some 10 story building fumigations, or 220 families in all, the first of its kind we understand. Where Bill finds the energies in his work-a-day, which usually starts at sunrise and ends at the next sunrise, to take care of his business activities as well as his multifarious Secretarial duties, we wouldn't know as we just couldn't keep awake long enough to find out.

V. H. MONTGOMERY: Chairman, Booth Exhibits and Advertising Committee, N. P. C. A. 1941 Convention, V. H. Montgomery was expected in Brooklyn the latter part of May to spend a couple of days with Bill and Helen, from whence we understand he was to travel east up New England way to pick up a new car before returning to his home on the Pacific Coast.

"Better buy than borrow."

ITEMS OF INTEREST

Helpful Hints For Employee Advancement

An employee can progress no faster than the company which he represents. Thoughtful employers everywhere recognize and reward ability. In so doing they make further progress possible for themselves as well as their employees. Conversely the employee will find it enlightend selfishnss on his part to draw from within himself the energy and resourcefulness for furthering and cashing in on new sales opportunities. In a sense each employee is his own employer. Recognition of that fundamental fact will give direction to his thinking, thereby making him of more account to his employer and being of more account means promotion and success every time. Any other attitude will usually bring about unhappy problems.

In brief:

1. Arrange your full day's work and then follow through according to plan.
2. A satisfied customer or user is the best sales assistant you can have in your work.
3. Get out in the field and dig. You've got to know all before you can tell all and if you'll tell more you'll sell more. Use questions frequently in your sales talk.
4. Don't generalize; get down to cases.
5. Hitch technical features and applications to the customer's problems and interests.
6. Invite action.
7. Don't knock your competitors.
8. Look, act and dress like a successful business man.
9. Remember time is your main capital resource. Use it accordingly.
10. Be enthusiastic. Sales effort without enthusiasm is like Damon without Pythias, ham without eggs.

The foregoing material was prepared by Louis Kotler, Orkin Exterminating Co., Memphis, Tenn. Knowing how busy he usually is, we appreciate and thank him for his helpful kindly spirit. Pest Control Operators everywhere are urged likewise to let their fellow Operators have the benefit of their experiences on any phase of Pest Control. Publication of such data is one way in which we feel PESTS can best serve the industry.—Ed.

Long Life Claimed for Fabric Treated with New Chemical

Chicago.—Fabrics treated with a new chemical and latex process known as Kolok, developed by the United States Rubber Co., double the life of the material as well as resist shrinking and repel moths, Dr. C. M. Teague, of the company's general development division, stated here on March 27, at the seventh annual Chemurgic Conference.

—New York World Telegram.

Anti-Squirrel Bill Passed

Measure to Protect Westchester Is Sent To Lehman

Albany.—The Legislature completed action tonight on an anti-squirrel bill for Westchester County and sent it to Governor Herber H. Lehman to determine whether or not it shall become law. The bill provides that "in the County of Westchester black or gray squirrels may be taken in any manner except by means of poison at any time, while in or on an occupied dwelling, by the owner or occupant thereof, or the duly authorized agent of either or both."

Assemblyman Malcolm Wilson, Westchester Republican, introduced the bill because he said squirrels had become so numerous they were invading the homes of the Westchester residents, and causing much destruction.

When to Fumigate

Fumigate at night only—an hour or more after sundown. Do not fumigate at an earlier time even though the day is dark or overcast, and the sun is not visible. There is a chemical reaction set up in the chlorophyll in the plants by day-time fumigation which causes "burning."

—Cynogas News, April.

In India they say: If you do not realize how an ant feels under your foot, it may help you to consider how you would feel under the foot of an elephant.

We get the idea!

Coney Rats Circulate in Library

Does anyone know how to cope with rats of "extraordinary size, boldness and ingenuity?" Then kindly communicate with the Coney Island branch of the Brooklyn Public Library.

These exceptional rats have virtually taken over the place, Miss Signe L. Steen, one of the librarians, writes in the library's official organ, "Among Ourselves." They "parade across the floor in broad daylight and at night have regular orgies, chewing everything from magazines to scrub brushes."

Miss Steen says that traps are no use; the rats simply steal the bait. Chemical exterminators have been tried, but the resultant odor of disentegrating rats has proved too much for the staff.

"The only solution," said Dr. Milton James Ferguson, chief librarian, "is for the city to provide funds for real library buildings."

—*N. Y. Evening Post.*

Herr Roach Invades The Capitol

Washington.—Congress was warned by one of its members today that it has "less to fear from Adolf Hitler invading the Capitol than from cockroaches."

Rep. Bender (R—O.) reported that the "cockroach situation" was terrible; that he had found nests of them in his desk—"some over three inches long"—and noticed them in great numbers in the Republican cloakrooms.

He called for a "housecleaning," and hoped to get $25,000 in the legislative appropriation to finance it.

Mosquito Expert In Army

Duncan E. Longworth Called to Help Fight Insects

Rockville Center, L. I.—Army camp mosquitoes are due for the first American Blitzkrieg of the war, for Duncan E. Longworth of the Nassau County Extermination Commission, has been called for active duty in the sanitary department of the Medical Corps. His first assignment is at Camp Davis, Wilmington, N. C.

—*N. Y. Times.*

Some Rules to Avoid Accidents In Pest Control Work

1. All workmen should wear gloves when handling chemicals or using electrical equipment.

2. When spraying, dusting chemicals, or doing dusty work, clean respirators should be worn.

3. No smoking should be permitted during working hours on any building under service.

4. See that no gas is escaping from leaking pipes, or no live electric wires are free in working areas.

5. Insist on properly nailed and braced scaffolding—inspect this work yourself.

6. Provide employees with all necessary well-conditioned tools, abundance of light, and see that electric light cords are hung up away from damp soil or wet chemicals.

7. Allow no drinking of intoxicants by employees—a workman under the influence of liquor is a potential hazard to himself and others.

8. Protect the eyes with glasses when using a tool grinder.

9. All necessary precautions should be taken to avoid acidents from falling objects; such as tools, loose plaster, scaffolding, etc. **Know** that all structural work done is adequate to the need—never guess.

10. Keep good brakes on all trucks and service cars.

11. In fumigation, all men should be provided with masks, ammonia crystals, and rubber gloves; and "what to do" and "how to do it" should be a part of his instructions.

12. First aid kits should be carried in the working equipment of each employee and he should be instructed in First Aid and Accident Prevention.

Termite Praised

Providence, R. I.—That lowly of all lowlies—the termite— has a defender in Brayton Eddy, state administrator of entomology and plant industry. He declares that the much-cursed insects are performing noble work in the wooded areas of the state by reducing to powder much of the timber downed by the hurricane.

Proving it's an ill wind that does not blow some good some of the time.

—*New York World Telegram.*

"Revolver" Detects Poison Gas

A "revolver" for quickly determining the presence of poisonous gasses has been developed, according to a patent (No. 2,234,-499) awarded to Robert W. McAllister of Carlisle, Mass.

The gas detector is an "eight shooter." Its chamber is loaded with eight glass cartridges containing chemicals which change color when gas is present. By the extent of the color change and type of color the investigator can determine what kind and how much of the poisonous gas is present.

The device is designed primarily for detecting such gases as hydrogen cyanide and sulphur dioxide, which are used for fumigating. It may be utilized to detect chlorine, the first gas used in the first World War; also iron carbonyl, formaldehyde and hydrogen sulphide.

The patent is assigned to Mine Safety Appliances Co., Pittsburgh, Pa.

—*N. Y. Times.*

Swarm of Ravenous Rats Kill Little Baby in Crib

(Special Dispatch to the Philadelphia Daily News)

Bridgeton, N. J., March 20.—Nine-month-old Curtis E. Graves is dead today after having been attacked in his crib by a swarm of ravenous rats.

The attack occurred while the child was alone in his home on Orange St. His grandparents, Mr. and Mrs. Matthew Graves, were attending a church social at the time.

They returned at midnight to find the baby unconscious, his body bloody and torn from the bites. A few hours later he died of "profound shock," according to physicians.

Indignant neighbors blamed the tragedy upon the Bridgeton Housing Authority, which they said had been requested a year ago to agree to a slum clearance project. The neighborhood, they said, would have been rid of rats through new housing.

A plate for holding poison bait which is provided with a protector which makes it impossible for children or dogs to reach the bait when it is set out won a patent for Edith P. Smith of Berkeley, Calif. The patent is No. 2,239,937.

—*N. Y. Times.*

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Additional Patents Relating to Pest Control

By DR. R. C. ROARK

EDITOR'S NOTE: *This service is provided through the Department of Agriculture for the purpose of bringing to the attention of those interested such matters that may be of assistance to the industry. The Department of Agriculture assumes no responsibility for the merits or workableness of of any of the inventions mentioned. Copies of all patents can be obtained for 10c (no postage stamps) sent to the Patent Office, Washington, D. C. When placing orders be sure to note the number of the patent, the date, the name of the patentee and the subject of the invention.*

2,221,820 (Nov. 19, 1940; appl. May 10, 1939). CYCLOALKYL-PHENOTHIOXINE COMPOUNDS. Frank B. Smith, and Harold W. Moll, Midland, Mich.—The Dow Chemical Company, Midland, Mich.—The patentees claim in a method for the preparation of cyclo-alkylated phenothioxine, the steps of mixing a cycloalkylating agent selected from the group consisting of the cycloalkenes and hydroxy-cycloalkanes with phenothioxine, and heating the mixture in the presence of an acid activated bleaching agent. Claim is also made for monocyclohexyl-phenothioxine, monocyclohexyl-3-chloro-phenothioxine, and monocyclohexyl-1-phenyl-phenothioxine. These are useful as insecticidal toxicants.

2,221,931 (Nov. 19, 1940; appl. June 3, 1939; in Switzerland, June 11, 1938). AGENTS FOR COMBATING PESTS. Jules Treboux, Neue Welt, near Basel, Switzerland—J. R. Geigy A. G., Basel, Switzerland.—A pest combating agent comprises at least one aliphatic aminoketone as reaction product from methylisobutylketone, formaldehyde and diethylamine.

2,222,486 (Nov. 19, 1940; appl. June 9, 1937). COMPOSITION FOR COMBATING INSECT PESTS. William Moore, Cox Cob, Conn.—American Cyanamid Company, New York, N. Y.—An insecticidal composition for soft bodied insects and allied pests includes a dinitro dialkyl phenol or a salt thereof.

2,222,968 (Nov. 26, 1940; appl. Oct. 7, 1935). INSECTICIDAL COMPOSITION. George L. Hockenyos, Springfield, Ill.—Monsanto Chemical Company, St. Louis, Mo.—An insecticidal composition comprises an aqueous oil emulsion, the oil phase having dissolved therein the substantially water-insoluble reaction product of nicotine and diamyl phenol, and the reaction product being relatively non-volatile as compared to nicotine.

2,223,367 (Dec. 3, 1940; appl. May 1, 1939). INSECTICIDE. Howard D. Hively, Charleston, W. Va.—An insecticide comprises a decoction of habak (**Ocimum basilicum** L. Family Labiatae) and a solvent.

2,223,693 (Dec. 3, 1940; appl. Nov. 15, 1937; in Switzerland, Nov. 25, 1936). THIOACETALSULPHONIC ACIDS AND A PROCESS OF MAKING SAME. Henry Martin and Rudolf Hirt, Basel, Switzerland—J. R. Geigy S. A., Basel, Switzerland.—These new, mostly stable, water-soluble condensation products with suitable substitution are strongly effective for the protection of wool, feathers, hairs, furs and the like against moths and like pests of the insect class.

2,223,813 (Dec. 3, 1940; appl. Feb. 21, 1938). INSECT EXTERMINATOR AND METHOD OF EXTERMINATING INSECTS. Elmer L. Brown, San Francisco, Calif.—Joseph B. Smith, San Francisco, Calif., as trustee.—A method for the destruction of insects and lower life organisms comprises subjecting the insects or organisms to an oscillatory electrostatic field, the field being excited by oscillatory electrical potentials having a wave length of the order of two to six centimeters.

2,224,090 (Dec. 3, 1940; appl. Aug. 18, 1938). GARMENT BAG. Albert W. Tucker and Bertrand Henry Piers, Washington, D. C.

2,224,243 (Dec. 10, 1940; appl. May 15, 1940). INSECTICIDE. Charles Verne Bowen, Bethesda, Md.—Henry A. Wallace, as Secretary of Agriculture of the United States of America, and his successors in office.—An insecticide contains as its essential active ingredient, 2-furan acrylamide.

2,224,485 (Dec. 10, 1940; appl. Nov. 29, 1939). ROACH TRAP. Adolf Pekkala, New York, N. Y.

2,224,622 (Dec. 10, 1940; appl. Nov. 29, 1937). INSECT REPELLENT. Frank A. Waples, deceased, late of Houston, Tex., by Cora R. Waples, executrix, Houston, Tex.—A composition of matter which on being burned will give off a light smoke for driving off mosquitoes and the like comprises charcoal (pulverized form), 2¼ to 2½ lbs.; resin (pulverized form), 2 to 2⅛ lbs.; tar (liquid pine tar), 7 to 8 ozs.; vegetable fiber (in the form of paper or wood pulp), 16 to 16½ lbs.; and water sufficient to make the composition mold.

2,224,723 (Dec. 10, 1940; appl. Dec. 24, 1937). CONTACT INSECTICIDE FROM PETROLEUM. Carleton Ellis, Montclair, N. J.—Standard Oil Development Co.—A horticultural contact insecticide consists of nitrated olefins, said olefins derived from petroleum.

2,224,839 (Dec. 17, 1940; appl. Jan. 6, 1938). DETERGENT GERMICIDE. Arthur L. Waugh, Duluth, Minn.—A germicidal detergent solution for sterilizing articles immersed therein contains ethyl alcohol not less than 70 percent, acetone U. S. P. 10 percent, methanol 5 percent, formaldehyde 3.725 percent, water not over 10 percent, and inert matter and impurities less than 1 percent.

2,224,890 (Dec. 17, 1940; appl. March 21, 1940). DETERGENT GERMICIDE. Arthur L. Waugh, Chicago, Ill.—A liquid detergent germicidal composition contains approximately four parts formaldehyde, six parts water and fifteen parts of a mixture of solvents consisting of methanol and acetone, said solvent mixture containing from one-half as much to twice as much methanol as acetone.

2,225,352 (Dec. 17, 1940; appl. Nov. 25, 1936). MOTHPROOFING COMPOUND AND METHOD OF USING. Lawrence W. Roberts, Philadelphia, Pa.—A mothproofing composition is composed essentially of about 50 percent of a member of the group consisting of magnesium silicofluoride and ammonium silicofluoride, about 30 percent of tartar emetic, about 10 to 17 percent of aluminum sulphate, and about 1 to 6 percent of a sulphonated higher alcohol.

2,225,573 (Dec. 17, 1940; appl. Mar 26, 1937; in the Netherlands Apr. 20, 1936). INSECTICIDE, FUNGICIDE, AND THE LIKE. Henricus Jacobus Charles Tendeloo, The Hague, Netherlands—Shell Development Co., San Francisco, Calif.—The patentee claims as an insecticide, fungicide, bactericide and the like, a preparation containing as an active ingredient an organic sulfide having at least one sulfur atom attached to two directly connected carbon atoms.

2,225,619 (Dec. 24, 1940; appl. Nov. 22, 1939). INSECTICIDAL COMPOSITION. Edgar C. Britton and Frank B. Smith, Midland, Mich.—The Dow Chemical Company, Midland, Mich.—An insecticidal and fungicidal composition comprises as a toxic ingredient the monocyclohexyl-amine salt of 2,4-dinitro-6-cyclohexyl phenol.

2,226,013 (Dec. 24, 1940; appl. Jan. 13, 1939). DUSTER. John E. Oys, Hastings, Minn.—H. D. Hudson Manufacturing Company, Chicago, Ill.

2,226,672 (Dec. 31, 1940; appl. Jan. 28, 1938). INSECTICIDE. Lloyd E. Smith, Washington, D. C.—People in the territory of the United States.—An insecticide con-

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tains as its essential active ingredient, p-chloroacetanilide or the corresponding bromo- or iodo- derivative.

2,227,058 (Dec. 31, 1940; appl. Dec. 27, 1939). TERPENE - CYANOACYL COMPOUND AND METHOD OF PRODUCING SAME. Joseph N. Borglin, Wilmington, Del. —Hercules Powder Company, Wilmington, Deleware.—The patentee claims a thiocyanoacylate of an alcohol which is the product of condensation of formaldehyde with dipentene in which the acyl group is derived from an aliphatic acid. The compounds according to this invention are useful in insecticides. For example, they may be used in kerosene solution in a concentration between about 0.5 percent and about 20 percent, with or without other toxic agents such as pyrethrum and rotenone, as contact spray insecticides, or in emulsions, or on solid carriers.

2,227,059 (Dec. 31, 1940; appl. Dec. 27, 1939). TERPENE - CYANOACYL COMPOUND AND METHODS OF PRODUCING SAME. Joseph N. Borglin, Wilmington, Del. —Hercules Powder Company, Wilmington, Del.—The patentee claims a terpene compound having the type formula ROOCR'XCN in which R is a radical of a terpene compound, in which the group OOCR' is a radical of a higher fatty acid, and in which X is a member of the group consisting of sulfur, selenium, and tellurium. The compounds according to this invention are useful in insecticides. For example, they may be used in kerosene solution in a concentration between about 0.5 percent and about 20 percent, with or without other toxic agents such as pyrethrum and rotenone, as contact spray insecticides, or in emulsions, or on solid carriers.

2,227,060 (Dec. 31, 1940; appl. Dec. 27, 1939). TERPENE - CYANOACYL COMPOUND AND METHOD OF PRODUCING SAME. Joseph N. Borglin, Wilmington, Del. —Hercules Powder Company, Wilmington, Del.—The patentee claims a terpene compound having the type formula ROOCR'XCN in which R is a radical of a terpene compound, in which the group OOCR' is a naphthenic acid radical, in which X is a member of the group consisting of sulfur, selenium, and tellurium and in which the -OOCR'XCN group is attached to a terpene carbon atom of radical R. The compounds according to this invention are useful in insecticides. For example, they may be used in kerosene solution in a concentration between about 0.5 percent and about 20 percent, with or without other toxic agents such as pyrethrum and rotenone, as contact spray insecticides, or in emulsions, or on solid carriers.

2,227,215 (Dec. 31, 1940; appl. Mar. 13, 1940). ALKYLENE ETHERS OF THIOAMMELINE. Herman A Bruson, Philadelphia, Pa.—The Resinous Products & Chemical Company, Philadelphia, Pa.—A method for preparing polyethers of thioammeline comprises reacting in the presence of an alkaline, acid-binding agent thioammeline and a beta-halogenoalkyl ether having at least three carbon atoms. The compounds obtained according to this invention are useful alone or in the form of their salts as bactericides or insecticides.

2,228,096 (Jan. 7, 1941; appl. Aug. 25, 1938). INSECTICIDAL COMPOSITION. Lionel E. Tisdale, Orlando, Fla.—E. I. du Pont de Nemours & Company, Wilmington, Del.—An example of this invention is technical dodecyl thiocyanate, 3 parts by weight; ground tobacco stems (1.25% nicotine), 20 parts by weight; and bentonite, 77 parts by weight.

2,228,170 (Jan. 7, 1941; appl. Jan. 24, 1938). INSECTICIDAL AND INSECTIFUGAL COMPOUNDS. Lowell B. Kilgore, Washington, D. C.—The patentee claims the group of organic chemical compounds characterized as gamma-substituted-alpha, gamma-diketo carboxylic acid esters wherein the gamma substitutions are from a group consisting of an alkyl group having more than one carbon atom, arlkyl and cycloparaffin groups which esters are useful as insecticides and insectifuges.

2,228,922 (Jan. 14, 1941; appl. July 11, 1939). APPARATUS FOR DISTRIBUTING FERTILIZERS, INSECTICIDES, OR THE LIKE. Andrew J. Gorlick, Cleveland Heights, Ohio—This invention relates to apparatus for distributing fertilizers, insecticides, or the like, and this device is capable of use with ordinary garden hose for distributing soluble or insoluble materials in a spray of water.

2,228,993 (Jan. 14, 1941; appl. Nov. 8, 1938). DEODORANT. Arthur W. Goldstein, Cincinnati, Ohio—Sixteen percent to Leon Goldberg, sixteen percent to Albert A. Yungblut, and sixteen percent to Charles E. Howard, all of Cincinnati, Ohio.—A liquid composition adapted to be sprayed into the air for deodorizing the air comprising anisic aldehyde, approximately 1¼ ounces, myrrh resin approximately 1¼ ounces, oil of bergamot approximately 5⅓ drams, phenyl ethyl alcohol approximately 5⅓ drams, and a quantity of benzyl alcohol sufficient to make approximately 1 gallon of finished solution.

2,229,010 (Jan. 14, 1941; appl. June 23, 1939). DIALKENYL - DIHODROXY - DIPHENYLS. Edgar C. Britton and John E. Livak, Midland, Mich.—The Dow Chemical Company, Midland, Mich.—These compounds are useful as toxicants, etc.

2,229,300 (Jan. 21, 1941; appl. Aug. 12, 1938). EXTERMINATING APPARATUS. Frank E. Montroy, Tom Govern, Joseph H. Gauthier, and Heskett I. Dawkins, Los Angeles, Calif.—Electric Traps, Inc., Los Angeles, Calif.—An electrical exterminator for killing rodents and other animal life is described.

2,229,360 (Jan. 21, 1941; appl. Mar. 18, 1938). METHOD OF FUMIGATION OF ORGANIC PRODUCTS. John M. Baer, Chicago, Ill.—The Guardite Corporation.—Bacteria in spices are destroyed with ethylene oxide.

2,229,685 (Jan. 28, 1941; appl. Dec. 6, 1939). RAT TRAP. George F. Swedenburg, Danville, Iowa—One-half to Lola Swedenburg, Danville, Iowa.

2,230,995 (Feb. 11, 1941 appl. Jan. 22, 1938; in British India, Dec. 10, 1937). LARVICIDE AND INSECTICIDE AND METHOD OF PRODUCTION THEREOF. Narayan Annappa Balvalli, Bombay, British India—One-half to F. S. Kerr & Co., Bombay, British, India—The toxic principle of cashew nut is dissolved in a liquid hydrocarbon.

2,231,322 (Feb. 11, 1941; appl. March 21, 1939). DEODORIZING AND DISINFECTING DEVICE. Lewis Cathcart, Chicago, Ill. —An electrical fumigating device is described.

2,231,390 (Feb. 11, 1941; appl. July 29, 1938). ANIMAL TRAP. John U. Lehn, Lititz, Pa.—Animal Trap Co. of America, Lititz, Pa.

2,232,034 (Feb. 18, 1941; appl. Jan. 13, 1939; in Switzerland, Jan. 14, 1938). ISATIN DERIVATIVE AND A PROCESS FOR ITS MANUFACTURE. Henry Martin, Otto Neracher, and Walter Stammbach, Basel, Switzerland—J. R. Geigy A. G., Basel, Switzerland—The present invention is based on the observation that N-benzyl isatin sulphonic acids, containing a sulphonic acid group in one of the positions 5 and 6 of the benzene radical of the indol nucleus radical, are particularly suitable for condensation with phenols or phenol derivatives. Such condensation products with a benzyl-radical free from sulphonic acid groups are characterized by the fact that when they are applied in the usual manner to textile fibres they have above all an especially good fastness to washing and fulling, so that they are extremely suitable for yielding a protection against moths which is stable to washing and fulling.

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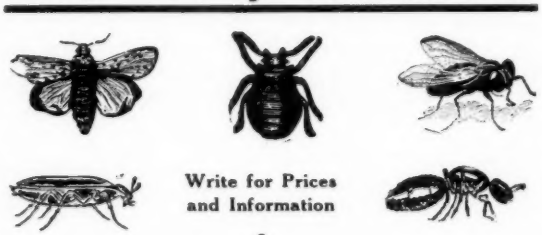

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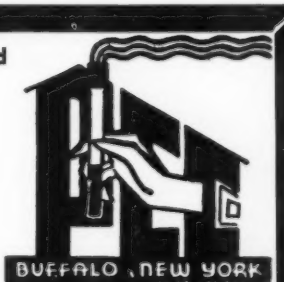

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WHEN FUMIGATING AGAINST CARPET BEETLES

Informative bulletin which discusses what to do when fumigating against carpet beetles—WRITE PESTS—BULLETIN No. 48.

NEW DATA ON KNOCKDOWN IN FLY SPRAYS

Manufacturer has just prepared a new folder dealing with Rate of Knockdown of Fly Sprays. The folder contains data pertinent to the important question of the speed of action of commercial insecticide concentrates in paralyzing houseflies. The lack of such significant data was becoming more apparent as interest in the knockdown question increased.

WRITE PESTS—ROHM.

DOG-CHECK

Circular describes remedy which manufacturers claims is effective for breaking dogs and cats of their undesirable habits, that rain will not wash it off, odor will last for three weeks and can be sprayed directly on new growth. Free sample if you write on your letterhead.

WRITE PESTS—NOTT CO.

GAS MASKS

Literature descriptive of gas masks of interest to fumigators. Manufacturer indicates masks are full visioned, affording wearer unobstructed vision, making for greater safety.

WRITE PESTS—Folder M387

FUMIGATION PROCEDURE REMINDERS

It is a good idea for everyone to check up on fumigation procedure every once in a while to make sure there are no slips anywhere. This bulletin discloses a few simple rules to insure satisfactory results.

WRITE PESTS—Bulletin No. 46.

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Manufacturer claims many new features such as no turning or twisting necessary; four openings; larger trap; contents ⅓ greater than any other competitive brand.

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SAFE FUMIGATION PRACTICES.

Worthwhile bulletin for office posting and kit use which discusses safe fumigation practices; what to do and not to do and causes of accidents statistically arranged.

WRITE PESTS—American.

MISCELLANEOUS NOTES ON FUMIGATION

Bulletin discusses exceptional conditions which must be watched for in household fumigation, anent painted surfaces—walls, foodstuffs, clocks, photographic films, etc.

Write PESTS—Cyanamid.

BRUSH CATALOG

The Flour City Brush Company of Minneapolis, Minn., has just published a new catalog showing a complete line of brushes and miscellaneous supplies for the janitor trade. Copies of this catalog are available upon request.

Write PESTS—Flour.

INSECTICIDE SOLVENT

Leaflet describes solvent which manufacturer states is absolutely odorless and stays odorless; 100% volatile; will not stain; completely refined; exceeds NAIDM Specifications; greater killing power.

WRITE PESTS—Pennsylvania.

WHAT OF MORIBUND KILL?
By Russell B. Stoddard

TEST METHODS FOR RECORDING MORIBUND KILL
By Dr. H. E. Whitmire

Informative brochure which discusses the importance of the so-called Moribund "Kill" as a factor in rating the value and effectiveness of household insecticides and insecticide materials. These two articles correct misapprehensions that may be extant and contribute to the simplification and clarification of the question.

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M.S.A. NEW FACEPIECE FOR GAS MASKS

Manufacturer claims following advantages: Provide maximum useable lens area; restrict dead air space to the minimum; prevent fogging of lenses; keep weight as low as possible; eliminate "pressure points" that cause headaches and fatigue due to soft rubber, moulded rubber facepiece that follows contour of face with minimum of tension of headbands.

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CARBOY DRAINER

Descriptive circular of Traun's Safety Carboy Drainer. It is claimed no pumping or syphoning involved; uninterrupted flow assured by air vent.

WRITE PESTS—Scientific.

Maybe the Jersey Skeeters Are Just Smarter

Atlantic City, N. J.—State Entomologist, Thomas J. Headlee told the New Jersey Mosquito Extermination Assn. yesterday that a new trap using dry ice to entice the insects into a lethal chamber caught 18,000 skeeters in one day, last summer. State Entomologist Louis A. Sterns, of Delaware, then rose and said a similar trap had caught 276,000 mosquitoes in one day in his state.

"It is obvious that New Jersey cannot hope to compete with Delaware in the number of mosquitoes which may be caught," Mr. Headlee observed.

—New York World Telegram.

A Buzz in Aviation

Kalamazoo, Mich.—A house fly will pull a model plane through the air, Wednesday at the Kalamazoo College annual New Year's model plane contest, officials promised today. The fly will be harnessed with a piece of thread to a miniature model and prodded into a "takeoff."

—New York World Telegram.

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